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L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

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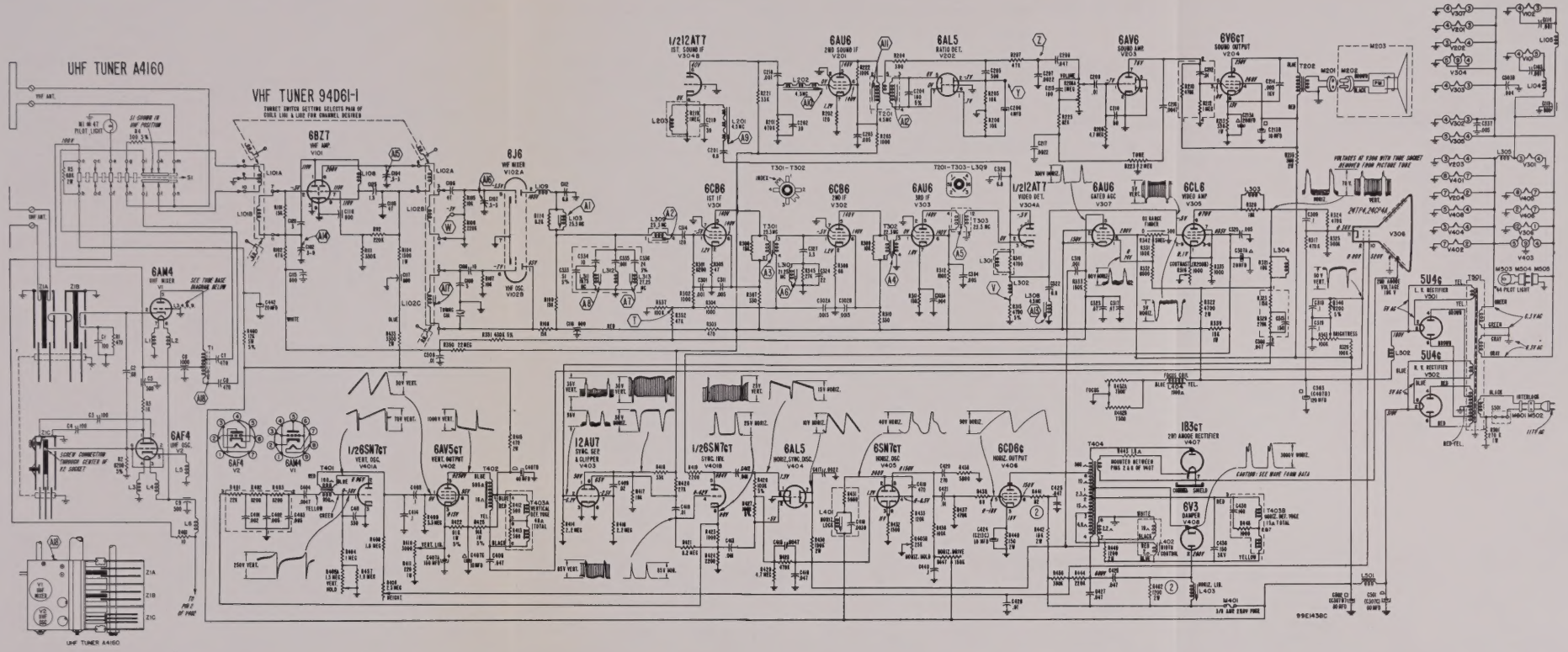

ADMIRAL CHASSIS 23F1Z (Models CU2516Z, CU2517Z, HU2516Z)

Schematic Courtesy of the Admiral Corp.

The PHOTOFACT Servicer

Set 374..Vol. 38 ★ Published for all users of Howard W. Sams' Photofact Folders ★ Oct.1, 1957

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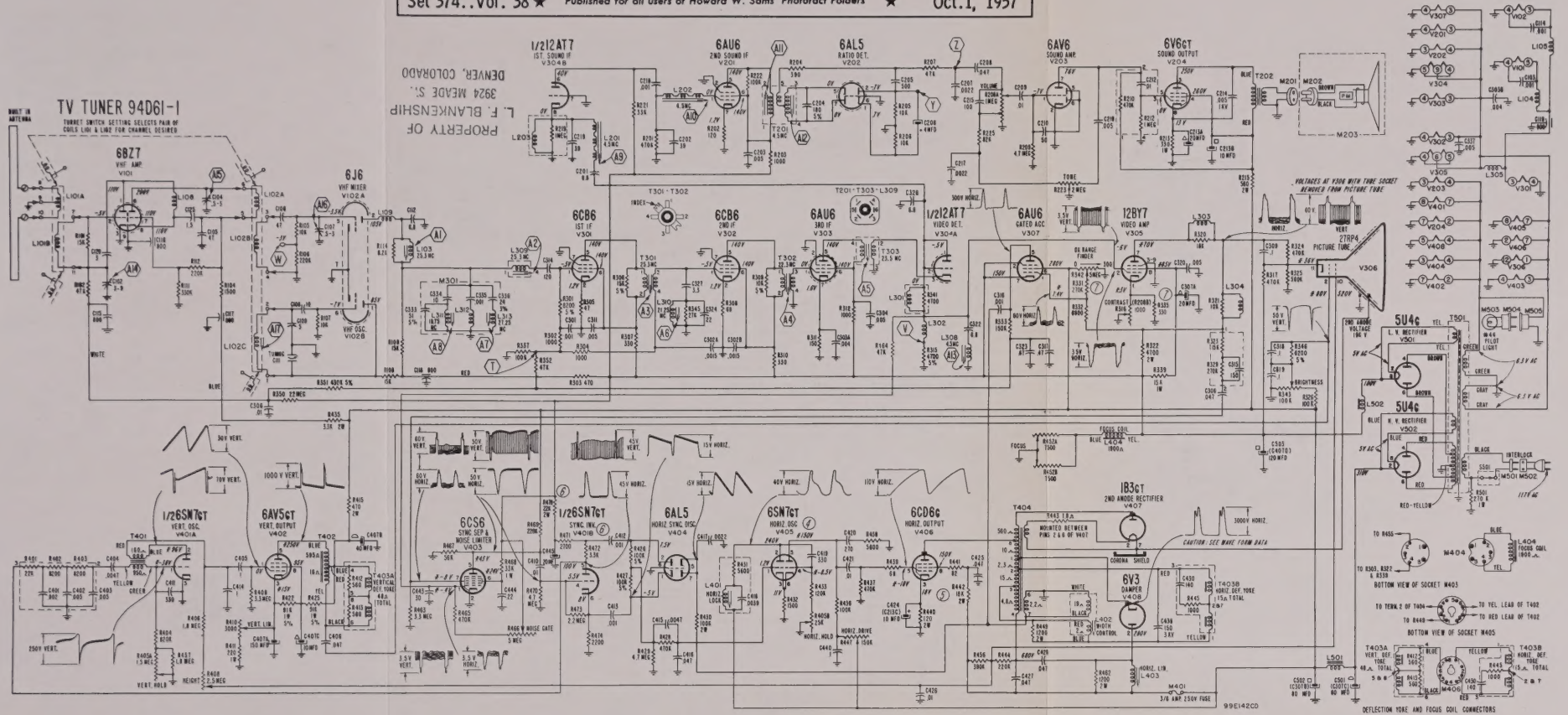

ADMIRAL MODELS
4P21, 4P22, 4P24, 4P28 (Ch. 4P2)

MODEL 4P24

PROPERTY OF
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3924 MEADE ST.
DENVER, COLORADO

ADMIRAL MODELS
4P21, 4P22, 4P24, 4P28 (Ch. 4P2)

TRADE NAME	Admiral Models 4P21, 4P22, 4P24, 4P28 (Chassis 4P2)
MANUFACTURER	Admiral Corp., 3800 W. Cortland St., Chicago 47, Illinois
TYPE SET	Battery Operated Portable AM Transistorized Receiver
POWER SUPPLY	6 Volts DC
RATING	18MA @ 6 Volts DC
TUNING RANGE—BROADCAST	535KC - 1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1		Loop	455KC (400% Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2		"	1620KC	"	"	A4	Adjust for maximum output. Repeat step 1 until no further increase is obtained.
3		"	1400KC	Tune to 1400KC signal	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
	The following step is not necessary unless it is impossible to tune in 535KC. Preset oscillator trimmer (A4) 1/4 turn from tight.						
4		Loop	535KC	Tuning gang fully closed	Across voice coil	A6	Fahion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. Repeat steps 2 & 4 (with step 2 last) until required range can be covered. Also repeat steps 3 & 1 in that order.

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PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N219	Converter		2N112		
X2	2N218	1st. IF Amplifier		2N111A		
X3	2N218	2nd. IF Amplifier		2N111A		
X4	2N217	Output		2N138A		

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	ADMIRAL PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	40	3	67B32-9	XPP3V40	NL40-3	TT3X40	ML40-6		TE-1057
C2	90	3	67B32-10	XPP3V100	NL100-6		ML100-3		TE-1102
C3	10	3	67B35-6	XPP3V10	NL10-3	TT3X10	ML10-6		TE-1053
C4	10	6	67B35-7	XPP6V10	NL10-6	TT6X10	ML10-6		TE-1087
C5	60	6	67B32-8	XPP6V60	NL60-6	TT6X60	ML75-6		TE-1101
C6	60	6	67B32-8	XPP6V60	NL60-6	TT6X60	ML75-6		TE-1101
C7	150	3	67B32-12	PWE3V200	NL200-3				R2427 *

* Non Catalog Item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	ADMIRAL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C8	50000		65B45-2	BPD-05	DF-503				5HK-S5	
C9	10000		65D10-14	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C10	50000		65B45-2							
C11	8.2		65D10-131	NP0-SI 8.2		C10V82C	TCO-8.2			
C12	9		65D6-126							
C13	50000		65B45-2							
C14	50000		65B45-2							
C15	50000		65B45-2							
C16	5		65D12-7	SI 5	D6-500	LT6V5	GP-5	UC-555	5GA-V5	
C17	50000		65B45-2							
C18	20000		65B45-4							
C19	50000		65B45-2							
C20	100000		65B45-10						5HK-P1	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ADMIRAL PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	2500Ω	1/4	75B36-1					Volume & Switch

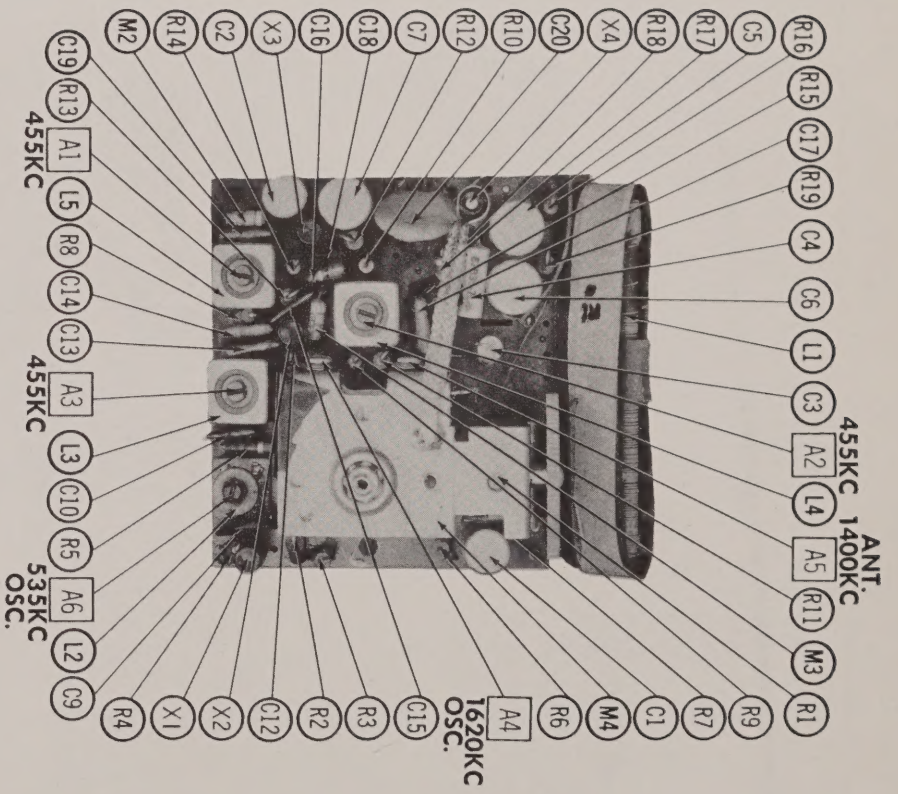
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ADMIRAL PART No.	IRC PART No.	
R2	8200Ω		60B8-822	BTS-8200	
R3	6800Ω		60B8-682	BTS-6800	
R4	3900Ω		60B8-392	BTS-3900	
R5	560Ω		60B8-561	BTS-560	
R6	47K 5%		60B7-473	BTS-47K 5%	
R7	1000Ω		60B8-102	BTS-1000	
R8	180Ω		60B8-181	BTS-180	
R9	6800Ω		60B8-682	BTS-6800	
R10	2700Ω		60B8-272	BTS-2700	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ADMIRAL PART No.	IRC PART No.	
R11	10K		60B8-103	BTS-10K	
R12	470Ω		60B8-471	BTS-470	
R13	3900Ω		60B8-392	BTS-3900	
R14	1500Ω		60B8-152	BTS-1500	
R15	20K 5%		60B7-203	BTS-20K 5%	
R16	15K		60B8-153	BTS-15K	
R17	5600Ω		60B8-562	BTS-5600	
R18	47Ω		60B8-470	BTS-47	
R19	100Ω		60B8-101	BTS-100	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	424Ω	14Ω	79B68-3 79D68-3 ②	GH105 ① GH105 ①			TR-18 ① TR-18 ①		① Tape center tap on primary ② Alternate Part No.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	ADMIRAL PART No.	QUAM PART No.	
SP1	2 3/4"	PM	14Ω	78B125		

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		ADMIRAL PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Stick	69C218-2				
L2	Osc. Coil	69B213-2				
L3	1st. IF	72C182-1		BC-321		
L4	2nd. IF	72C182-2		BC-322		
L5	3rd. IF	72C182-3		BC-323		

BATTERIES

ITEM No.	VOLTAGE	ADMIRAL PART No.	REPLACEMENT DATA								NOTES
			BURGESS		EVEREADY		MALLORY		RAY-O-VAC		
			"A"	"B"	"A"	"B"	"A"	"B"	"A"	"B"	
M1	6V		Z		915 or Mercury E502		M-15 or Mercury ZM-9		7-R		Connect 4 cells in series.

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		ADMIRAL PART No.	CBS PART No.	SYLVANIA PART No.	
M2	1N295		1N60	1N60	Audio Det.
M3	1N295		1N60	1N60	Limiter

MISCELLANEOUS

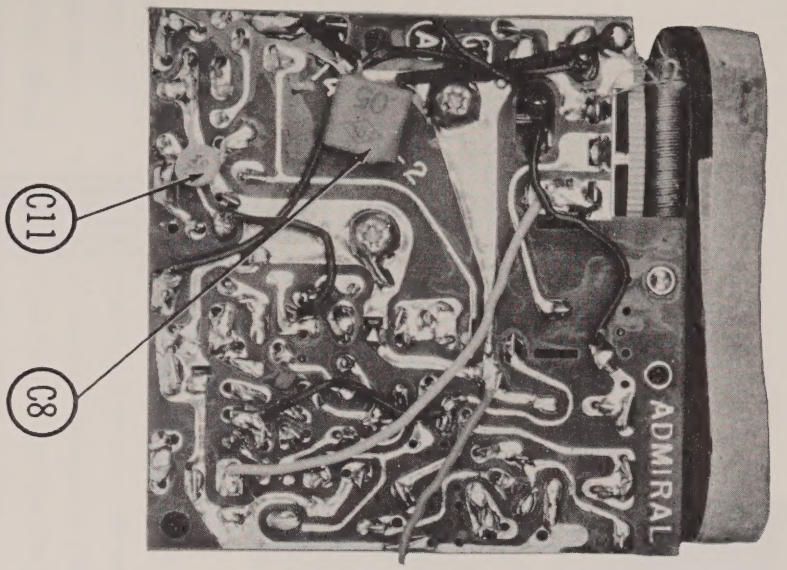
ITEM No.	PART NAME	ADMIRAL PART No.	NOTES
M4	Tuning Cap.	68B67-1	2 Gang (Ant. 8-130MMF)

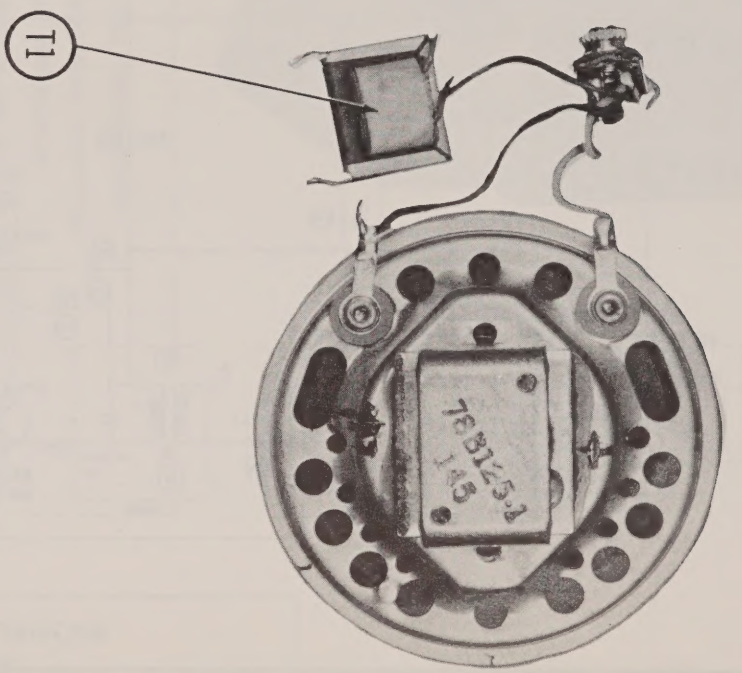
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

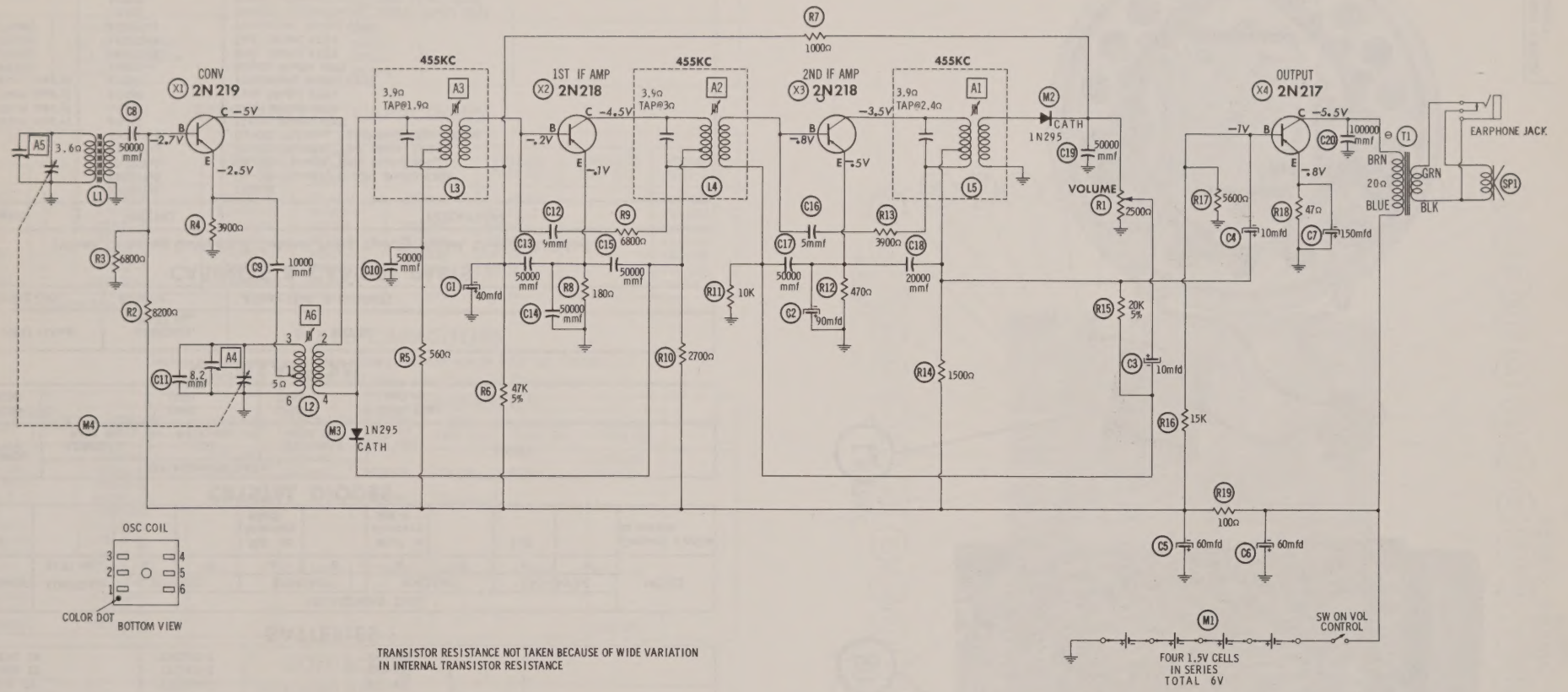
NAME	PART NO.	DESCRIPTION
Knob	33C217-1	Tuning
Knob	33C217-2	On-Off-Volume, Black; Model 4P21
Knob	33C217-3	On-Off-Volume, Red; Model 4P22
Knob	33C217-4	On-Off-Volume, Tan; Model 4P24
Knob	33C217-5	On-Off-Volume, Turquoise; Model 4P28
Cabinet (Back Ass'y)	A5649	Black; Model 4P21
Cabinet (Back Ass'y)	A5582	Red; Model 4P22
Cabinet (Back Ass'y)	A5650	Tan; Model 4P24
Cabinet (Back Ass'y)	A5651	Turquoise; Model 4P28
Cabinet (Front)	34E115-1	Black; Model 4P21
Cabinet (Front)	34E115-2	Red; Model 4P22
Cabinet (Front)	34E115-4	Tan; Model 4P24
Cabinet (Front)	34E115-8	Turquoise; Model 4P28
Cover	A5645	Battery Compartment, Black; Model 4P21
Cover	A5583	Battery Compartment, Red; Model 4P22
Cover	A5646	Battery Compartment, Tan; Model 4P24
Cover	A5647	Battery Compartment, Turquoise; Model 4P28
Handle	37A155-2	Chrome
Earphone Jack	88B39-3	

CHASSIS—BOTTOM VIEW





ADMIRAL MODEL 4P21 (Ch. 4P2)



TRANSISTOR RESISTANCE NOT TAKEN BECAUSE OF WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum. no signal apllied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1957

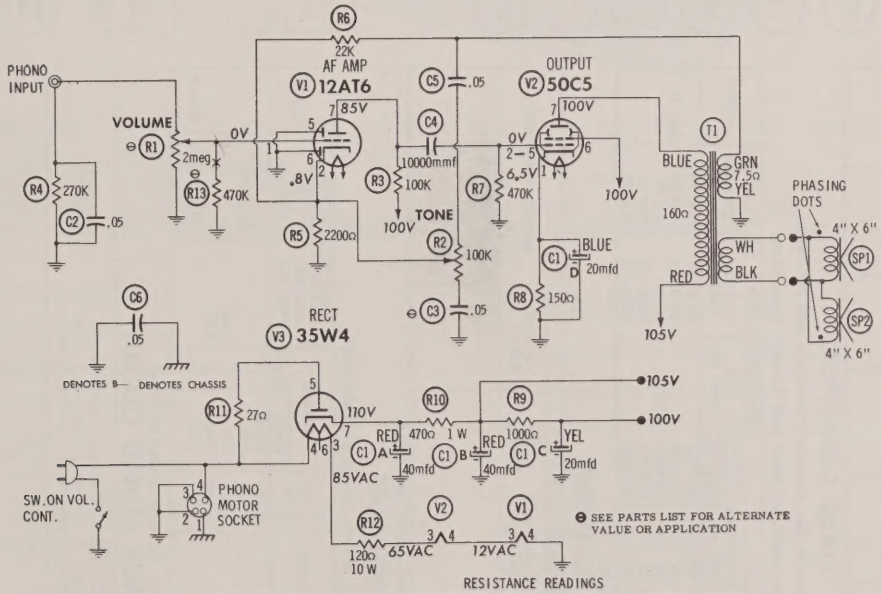
AIRLINE
MODEL GAA-864A

AIRLINE
MODEL GAA-864A

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

AIRLINE
MODEL GAA-864A

TRADE NAME	Airline Model GAA-864A
SUPPLIER	Montgomery Ward & Co., 619 Chicago Ave., Chicago, Illinois
TYPE SET	AC Operated Phono Amplifier With 4 Speed Manual Record Player
TUBES (Three)	Types 12AT6 AF Amplifier, 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC- 60 Cycles RATING .27 Amp. @ 117 Volts AC (26 Watts Without Motor)



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12AT6	0Ω	2200Ω	16Ω	0Ω	0Ω	0Ω	†100K
V2	50C5	150Ω	470K	70Ω	16Ω	470K	† 1500Ω	† 530Ω
V3	35W4	NC	NC	180Ω	220Ω	250Ω	210Ω	20K(MIN)

† MEASURED FROM PIN 7 OF V3.
NC NO CONNECTION.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1957

374-2

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF Amplifier	12AT6	
V2	Output	50C5	
V3	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA AIRLINE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	40	150	1019		BBRQ-44315C	WQ230			R2199*
B	40	150							
C	20	150							
D	20	25							

* Non-Catalog Item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA AIRLINE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	.05	400		BPD-05	DF-503	CUB4S5		GEM-415	4TM-S5	
C3	.05	200		BPD-05	DF-503	CUB2S5		GEM-415	2TM-S5	Note #1
C4	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C5	.05	200		BPD-05	DF-503	CUB2S5		GEM-415	2TM-S5	
C6	.05	400		BPD-05	DF-503	CUB4S5		GEM-415	4TM-S5	

Note #1. Some versions may use .1MFD in this application.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA AIRLINE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2Meg	½	412A	B-76				Volume - Note #1.
B	Shaft			Not Req.				
C	Switch			KB-1				
R2A	100K	½	416	B-40				Tone
B	Shaft			Not Req.				

Note #1. 2.5Meg or 3Meg control may be used in some versions (Part #401E).

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA AIRLINE PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R3	100K			BTS-100K	
R4	270K			BTS-270K	
R5	2200Ω			BTS-2200	
R6	22K			BTS-22K	
R7	470K			BTS-470K	
R8	150Ω			BTS-150	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA AIRLINE PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R9	1000Ω			BTS-1000	
R10	470Ω	1		BTA-470	
R11	27Ω		542		
R12	120Ω	10	625		
R13	470K			BTS-470K	Note #1

Note #1. Not used in some versions.

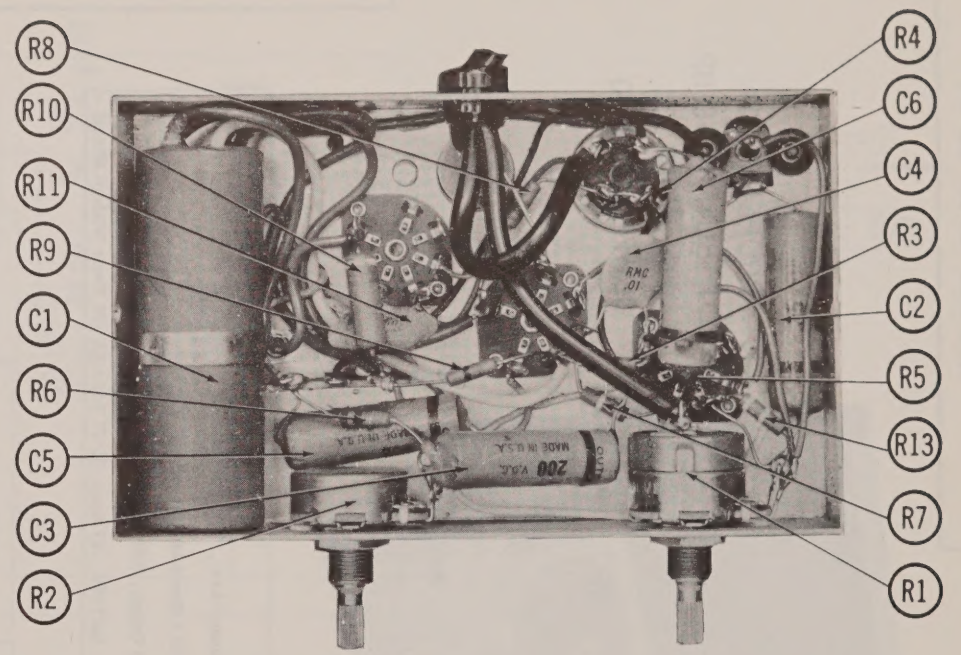
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.1	REPLACEMENT DATA AIRLINE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2400Ω	3-4Ω	1209C						
	Turns	Ratio							
	PRI.	SEC. 2							
	5:	1							

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA AIRLINE PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	4" x 6"	PM	6-8Ω	2938 ①	46A07Z6 ①	① Parallel & Phase
SP2	4" x 6"	PM	6-8Ω	2938 ①	46A07Z6 ①	

CHASSIS—BOTTOM VIEW



PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA AIRLINE PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. MOUNT	REMARKS
M1	60-48	87-T		56	*PT-1	* Not required unless original mounting bracket is damaged.
		† P-81T		† 2756		† Tone arm complete with cartridge.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA AIRLINE PART No.	JENSEN PART No.	WALCO PART No.	REMARKS
M2				

MISCELLANEOUS

ITEM No.	PART NAME	AIRLINE PART No.	NOTES
M3	Motor	2584	(Alliance)
	Motor	2594	(G.I.)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	2430A	Tone
Knob	2430B	On-Off-Volume

PHOTOFACT* Folder

*TRADE MARK

RETMA MEMBER

CORONADO
MODEL TV3-9401A

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Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

CORONADO
MODEL TV3-9401A

TRADE NAME	Coronado Model TV3-9401A
SUPPLIER	Gamble-Skogmo, Inc., 15 North 8th. Street, Minneapolis, Minn.
TYPE SET	Television Receiver
TUBES	Thirteen
POWER SUPPLY	110-120 Volts AC, 60 Cycle RATING 115 Watts, 1 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

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Tube Placement Chart (Top View) 3

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CORONADO
MODEL TV3-9401A

PROPERTY O
L. F. BLANKENSHIP
3924 MEADE ST
DENVER, COLO

DISASSEMBLY INSTRUCTIONS

CABINET REMOVAL

1. Remove 6 push-on type control knobs from the top.
2. Remove 4 metal screws and the rear cover.
3. Remove 2 metal screws and the AC interlock bracket.
4. Remove 2 speaker leads.
5. Place receiver face down on a soft pad.
6. Remove 2 metal screws from the front of the handle.
7. Remove 6 metal screws around the front edge of the cabinet.
8. Remove 2 chassis bolts from the bottom.
9. Lift cabinet up and off the chassis assembly.
10. Remove 2 hex nuts and the speaker.

CAUTION NOTE

ONE SIDE OF AC LINE CONNECTED TO CHASSIS
Care should be exercised when connecting test equipment or physically contacting the chassis

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF oscillator is possible by removing the channel selector and fine tuning knobs. Set the fine tuning at the center of its range. One slug for HIGH band adjustment is located at 1 o'clock, and should be adjusted first. The LOW band adjustment is located at 5 o'clock. Adjust for best picture and sound.

PICTURE TUBE SAFETY GLASS CLEANING

For picture tube and safety glass cleaning, it is necessary to remove the chassis. (See disassembly instructions). Remove 4 metal screws holding the safety glass and mask inside the front of the cabinet. Remove the safety glass and mask.

FOCUS

The focus may be varied by the position of a strap on the base of the picture tube. The strap can be connected between pins 6 and 10 or 6 and 2. Readjust the ion trap for the best focus consistent with maximum brightness.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the horizontal oscillator, it is necessary to remove the rear cover and supply power to set. Set the horizontal hold at the center of its range and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally. (For location see tube placement chart).

FUSES

A 4.7Ω fusible resistor (R67) is used for LV power supply protection. (For location see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting the two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

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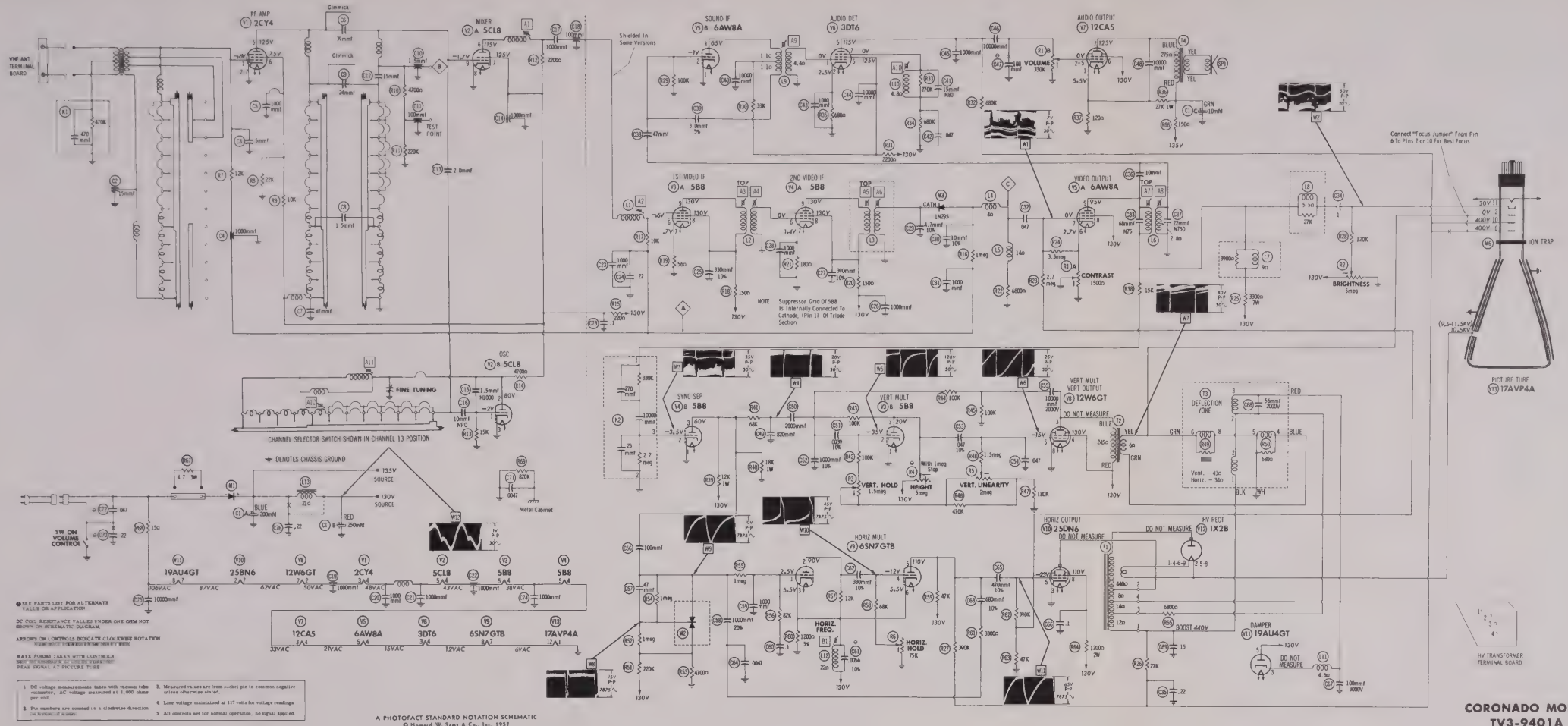
RF AMP V1 2CY4
MIXER V2A 5CL8
SOUND IF V5B 6AW8A
AUDIO DET V6 3DT6
AUDIO OUTPUT V7 12CA5
1ST VIDEO IF V3A 5B8
2ND VIDEO IF V4A 5B8
VIDEO OUTPUT V5A 6AW8A
OSC V2B 5CL8
SYNC SEP V4B 5B8
VERT MULT V3B 5B8
VERT MULT VERT OUTPUT V8 12W6GT
HORIZ MULT V9 6SN7GTB
HORIZ OUTPUT V10 25DN6
HV RECT V12 1X2B
DAMPER V11 19AU4GT
PICTURE TUBE V13 17AVP4A
CONTRAST
BRIGHTNESS
VOLUME
HORIZ. FREQ.
HORIZ. HOLD
VERT. HOLD
HEIGHT
VERT. LINEARITY
BOOST 440V
ION TRAP
FINE TUNING
CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION
DENOTES CHASSIS GROUND
SW ON VOLUME CONTROL
135V SOURCE
130V SOURCE
Metal Cabinet
DEFLECTION YOKE
DO NOT MEASURE
Connect "Focus Jumper" From Pin 6 To Pins 2 or 10 For Best Focus
NOTE Suppressor Grid Of 5B8 Is Internally Connected To Cathode, (Pin 1), Of Triode Section
19AU4GT 25BN6 12W6GT 2CY4 5CL8 5B8 5B8
12CA5 6AW8A 3DT6 6SN7GTB 17AVP4A
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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CORONADO MODEL TV3-9401A

TUBE PLACEMENT CHART

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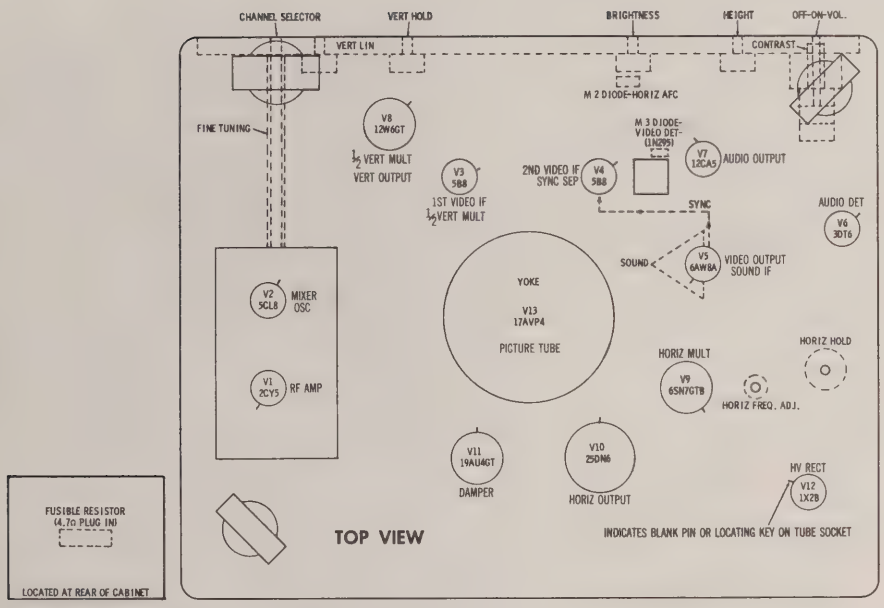


TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

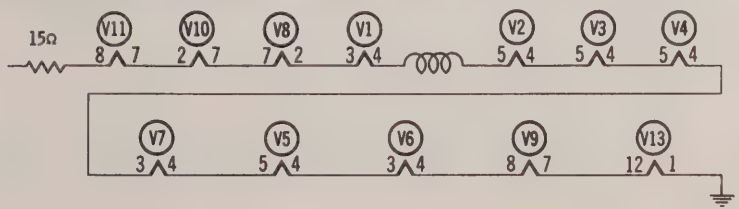
POWER SUPPLY FAILURE
No raster, no sound - **Fusible Resistor (R67), Rectifier (M1)**

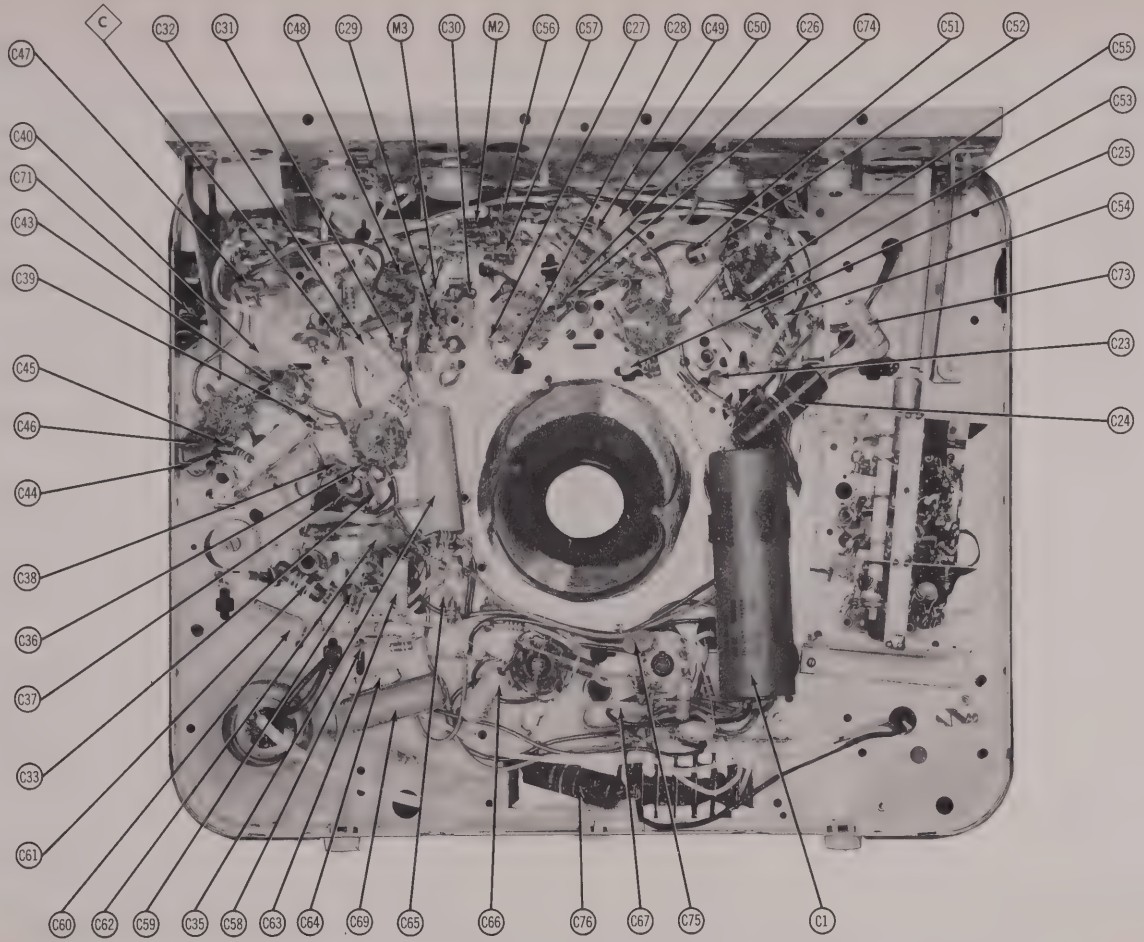
LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V3, V4, Diode (M3), V5**
No pic, no sound, has snow - **V1, V2**
No pic, has sound, has raster - **V5, V13**
Has pic, no sound - **V5, V6, V7**

SYNC FAILURE
No vert. sync - **V4**
No horiz. sync - **V4, Diode (M2)**
No vert. or horiz. sync - **V4**

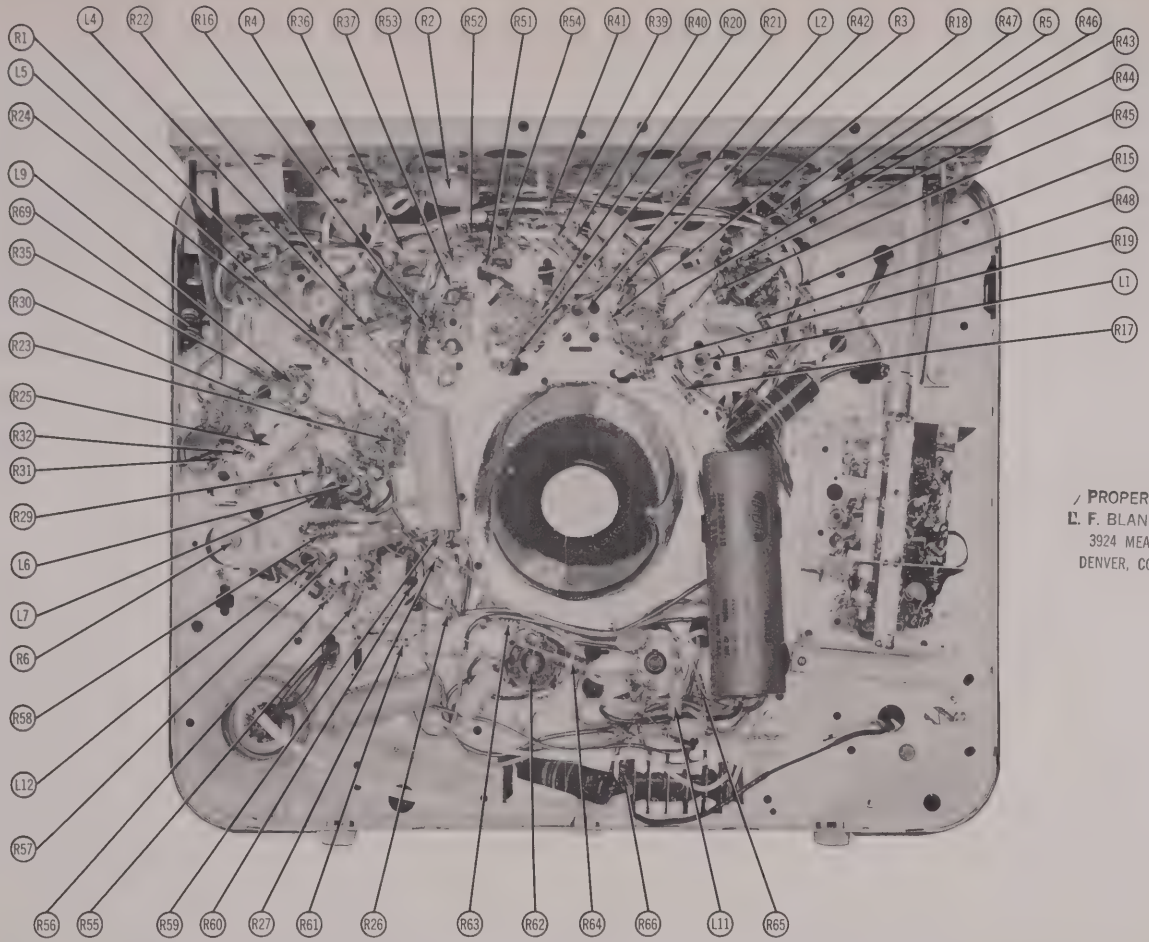
SWEEP FAILURE
No raster, has sound - **M2, V9, V10, V11, V12, V13**
No vertical deflection - **V3, V8**
Poor vert. linearity or foldover - **V3, V8**
Poor horiz. linearity or foldover - **V9, V10, V11**
Narrow picture - **V9, V10, V11, M1**
Vert. off freq. - **V3, V8**
Horiz. off freq. - **V9**

This receiver employs tubes used in a series filament network, an open filament in any tube in the series will cause the set to be inoperative. (See circuit below.).





CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.
The High Voltage lead should be securely taped and kept away from the chassis.

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt bias supply to point Ⓐ. Positive to chassis.
Disable the oscillator by replacing the 5CL8 (V2) with a 5CL8 having pin 1 removed.
Short the antenna terminals.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	1000MC Ceramic Capacitor	High side to point Ⓑ. Low side to chassis.	44.0MC (10MC Swp)	42.75MC 45.75MC	Any non-interfering channel	Vert. Amp. thru detector (Fig. 1) to pin 9 (plate) of 5B8 (V3). Low side to chassis.	A1, A2	Adjust for response similar to Fig. 2 with markers in proper positions.
2.	"	High side to pin 6 (grid) of 5B8 (V3). Low side to chassis.	"	"	"	Vert. Amp. thru detector (Fig. 1) to pin 9 (plate) of V4. Low side to chassis.	A3, A4	"
3.	"	High side to pin 6 (grid) of 5B8 (V4). Low side to chassis.	"	"	"	Vert. Amp. thru 10K to point Ⓒ. Low side to chassis.	A5, A6	"
4.	"	High side to point Ⓑ. Low side to chassis.	"	"	"	"		Retouch A1 thru A6 as needed for response curve similar to Fig. 3. Remove bias and replace V2 in its socket.

SOUND IF ALIGNMENT

Set the contrast control fully clockwise.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	1000MMF Ceramic Capacitor	High side to point Ⓒ. Low side to chassis.	Not used	4.5MC (400∿ 30% AM)	Any non-interfering channel	Vert. Amp. thru detector (Fig. 4) to pin 11 (cathode) of picture tube. Low side to chassis.	A7	Turn A7 fully counter clockwise. Turn A8 fully clockwise. Turn A7 clockwise for MINIMUM 400∿ indication on scope.
6.	"	"	4.5MC (15KC Swp)	Not Used	"	Across secondary of output transformer.	A8, A9 A10	Use only enough sweep generator output to provide usable pattern on scope. Turn A10 fully counter clockwise. Adjust A8, A9 and A10 for maximum indication on scope. Remove test equipment and tune in a local TV station. Retouch A10 for MINIMUM buzz.

OSCILLATOR ALIGNMENT

Turn the set on and tune in the highest high band channel (7-13) operating in the area. Adjust A11 for best picture and sound, located above and to the right of the tuning shaft. Switch to the highest low band channel (2-6) operating in the area and adjust A12 for the best picture and sound. A12 is located directly below the tuning shaft.

RF AND MIXER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

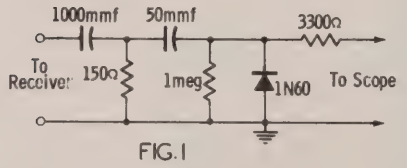


FIG. 1

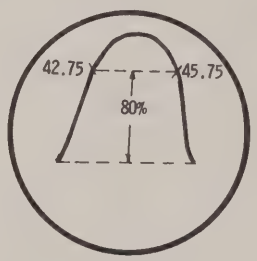


FIG. 2

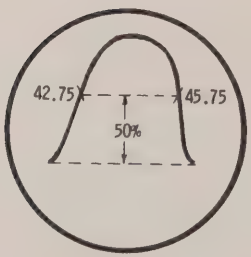


FIG. 3

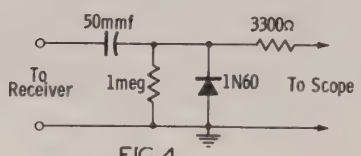
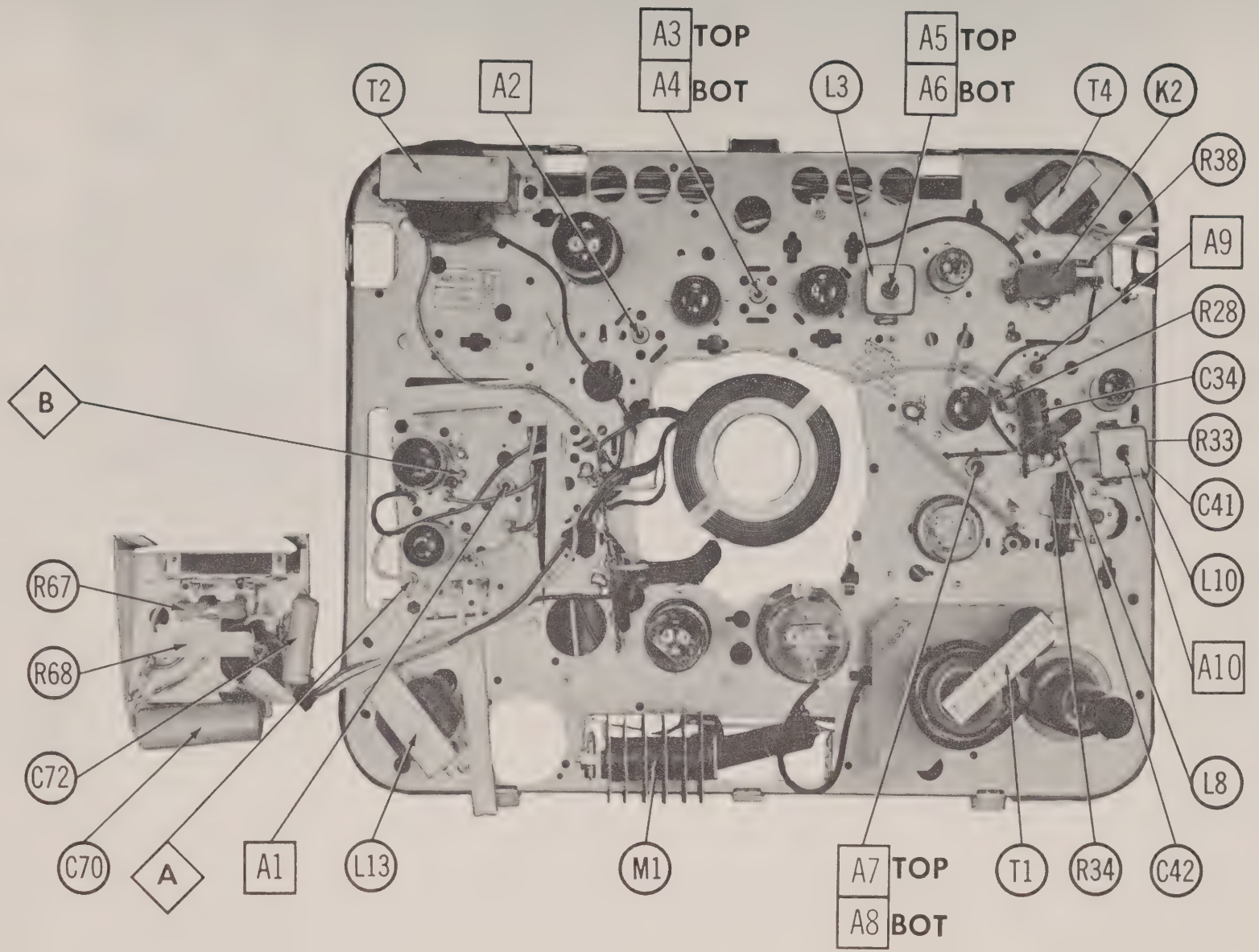


FIG. 4



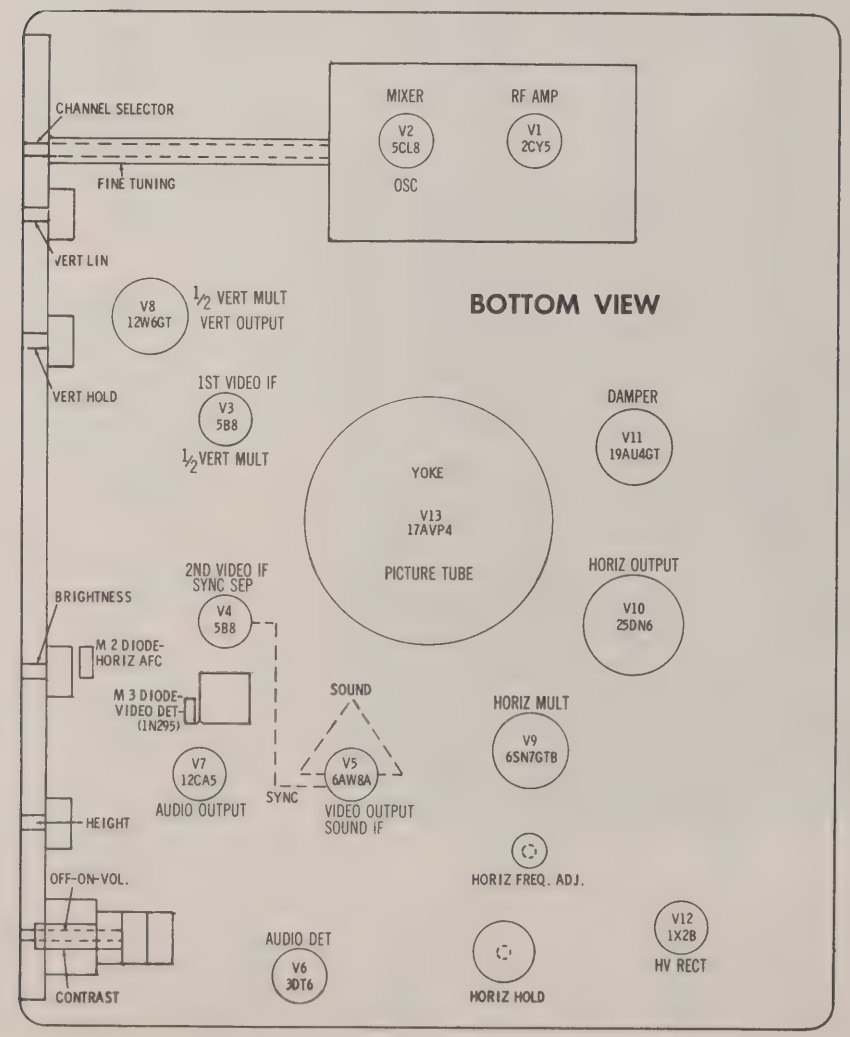
CHASSIS TOP VIEW

CORONADO MODEL
TV3-9401A

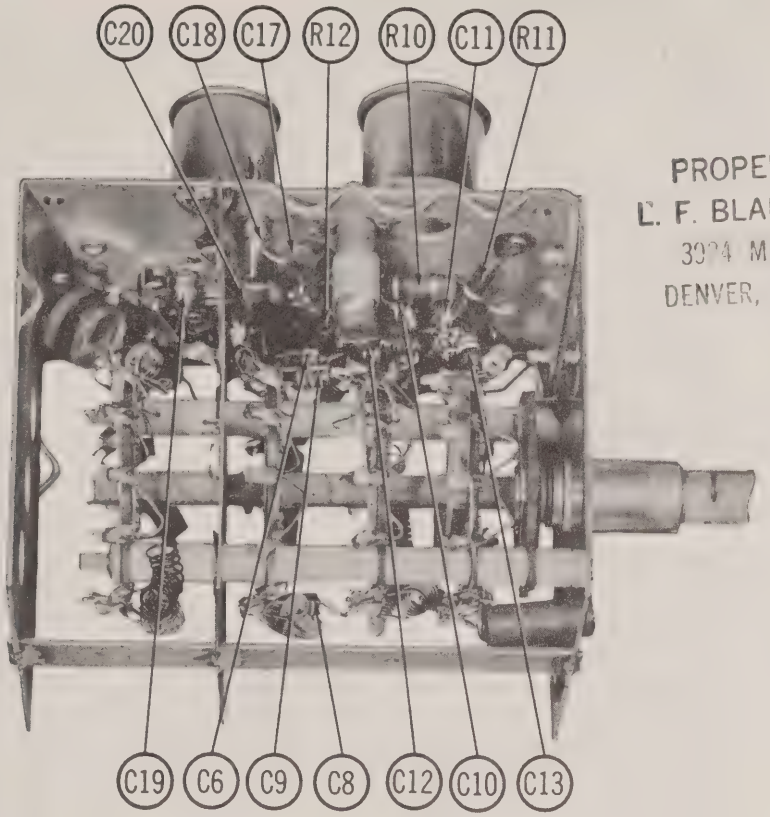
RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	2CY5	1Meg	0Ω	12Ω	11Ω	†240Ω	†10K	0Ω		
V2	5CL8	15K	†5000Ω	0Ω	9.5Ω	11Ω	†2400Ω	†240Ω	0Ω	220K
V3	5B8	0Ω	•1Meg	•†1.4Meg	8.5Ω	9.5Ω	1Meg	56Ω	†170Ω	†170Ω
V4	5B8	0Ω	2.2Meg	†7000Ω	7.5Ω	8.5Ω	.1Ω	180Ω	†170Ω	†170Ω
V5	6AW8A	0Ω	100K	†35K	4Ω	5Ω	•180Ω	1.5Meg	†21Ω	†3300Ω
V6	3DT6	4.4Ω	680Ω	4Ω	3Ω	‡700K	†2200Ω	680K		
V7	12CA5	120Ω	0Ω	7.5Ω	5Ω	0Ω	†21Ω	†425Ω		
V8	12W6GT	TP	12Ω	†260Ω	†21Ω	•1.8Meg	TP	14Ω	0Ω	
V9	6SN7GTB	1.7Meg	†12K	1200Ω	•90K	†47K	1200Ω	1.5Ω	3Ω	
V10	25BN6	TP	20Ω	0Ω	NC	400K	NC	14Ω	†1200Ω	TOP CAP ‡11Ω
V11	19AU4GT	NC	TP	¶	NC	†21Ω	TP	20Ω	23Ω	
V12	1X2B	PINS 1 THUR 9 HAVE INFINITE RESISTANCE								TOP CAP ‡400Ω
V13	17AVP4	0Ω	12Ω	PIN 6 ‡27K	PIN 10 ‡27K	PIN 11 •210K	PIN 12 1.5Ω			

TP TIE POINT
NC NO CONNECTION
† MEASURED FROM OUTPUT OF M1.
• THIS READING WILL VARY, CONTROL SET FOR NORMAL OPERATION.
‡ MEASURED FROM PIN 3 OF V11.
¶ THIS READING CAN VARY GREATLY, (10K MINIMUM), DUE TO THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.



TUBE PLACEMENT CHART



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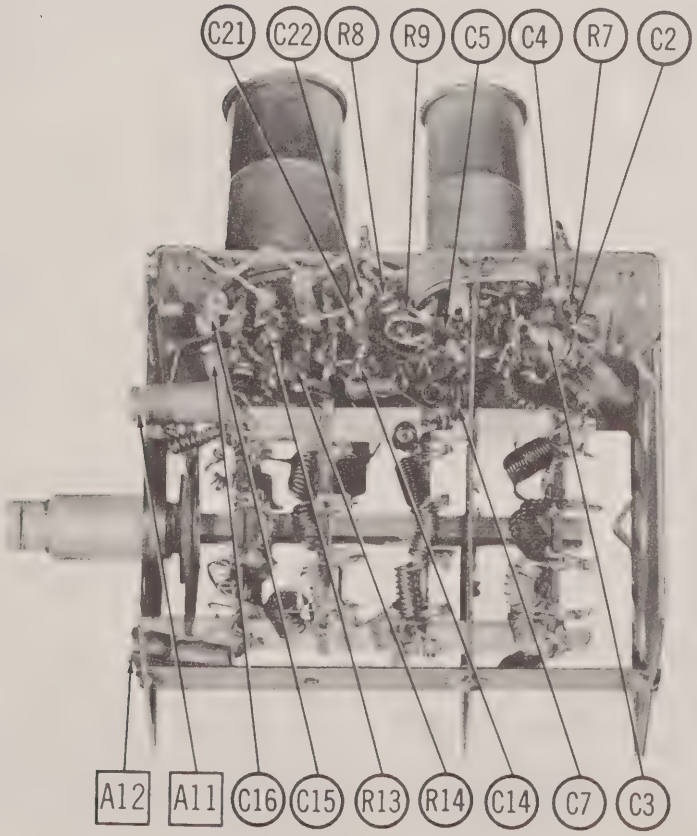
RF TUNER-RIGHT SIDE



RF TUNER-LEFT SIDE

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	2CY5	
V2	Mixer/Osc.	6CL6	
V3	1st Video IF Amp. - Vert. Mult.	3B6	
V4	2nd Video IF Amp - Sync Sep	3B6	
V5	Video Output-Sound IF Amp	6AW8A	

ITEM No.	USE	TYPE	NOTES
V8	Audio Det	3DT6	
V7	Audio Output	12CA5	
V8	Vert. Mult. - Vert. Output	12W6/T	
V9	Horiz. Mult.	6BN7/T6	
V10	Horiz. Output	12BH6	
V11	Damper	1B4/AGT	
V12	HV Rectifier	1X2B	

PICTURE TUBE

ITEM No.	REPLACEMENT DATA: CORONADO PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	NOTES
V12	17AVP4A	17AVP4A ① 17AVP4 -17AP4A -17AP4A1	1 Silver screen '65 2 Aluminized	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING: CAP.	VOLT	REPLACEMENT DATA: CORONADO PART No.	AEROVOX PART No.	CORNELL DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	200	150	454433	PR3-912	XM3129	WT320		D-995	R22.5 *
B	150	50						MT-1510	
C	50	150							

* Non-catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	VOLT	REPLACEMENT DATA: CORONADO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1	15									
C2	5.0		BPD-000008	DD-050	L10Y5	ED-5		Z7-555	5GA-V5	
C4	1000		EF-001	MFT-1000					500C-DI	
C5	1000		BPD-001	DD-102	BYA501	ED-1000		DC521	5HK-DI	
C6	.38									
C7	47		BPD-000047	DD-470	L10Q47	ED-47		UC-5447	5GA-Q47	
C9	1.5		VP0-SI 1.5	TCE-1R5	C10Y15C	TCO-1.5		ZT-5515	5TCCB-V15	
C9	.34									
C10	1.5									
C11	.100									
C13	15		BPD-000015	DD-150	L10Q15	ED-15		UC-5415	5GA-Q15	
C13	5.0		VP0-SI 5.0	TCE-5R0	C10Y5C	TCO-5.0			5TCCB-V5R	
C14	1000		EF-001	MFT-1000					500C-DI	
C15	15									N1000
C16	10		VP0-SI 10	TCE-10	C10Q1C	TCO-10		Z7-511	5TCC-CI	N150
C17	1000		BPD-001	DD-102	BYA501	ED-1000		DC521	5HK-DI	
C18	100									
C19	1000		EF-001	MFT-1000					500C-DI	
C20	1000		BPD-001	DD-102	BYA501	ED-1000	DC521		5HK-DI	
C21	1000		BPD-001	DD-102	BYA501	ED-1000	DC521		5HK-DI	
C23	1000		EF-001	MFT-1000					500C-DI	
C24	1000		47A200	BPD-001	DD-102	BYA501	ED-1000	DC521	5HK-DI	
C24	.33	200	46BT124L3	P36BN-33		CUB3P33		GEM-3022	3TM-P33	
C25	330		47A68	1465-00033	GP-330	SRD733	ED-330		MS-333	10%
C26	1000		47A200	BPD-001	DD-102	BYA501	ED-1000	DC521	5HK-DI	
C27	300		47A859		GP-300	SRD739	ED-300		MS-339	10%
C28	1000		47A200	BPD-001	DD-102	BYA501	ED-1000	DC521	5HK-DI	
C29	4.7		47B403-S	VP0-SI 4.7	TCE-4R7	CT-ER4747	TCO-4.7	ZT-5547	5TCCB-V470S	
C30	10		47CA10A100K	VP0-SI 10	TCE-10	C10Q1	ED-10	ZT-541	5TCC-V1	10%
C31	1000		47A200	BPD-001	DD-102	BYA501	ED-1000	DC521	5HK-DI	
C33	.047	300	46BT473L3			CUB3S47		GEM-4147	3TM-S47	
C34	68		47-633							N75
C34	.1	200	46BT104L3	P36BN-1	DF-104	CUB3P1		GEM-201	3TM-P1	
C35	.22	600	46BR224L6	P36BN-23		CUB6P23		GEM-6022	6TM-P22	
C36	10		47A80-U	SI 10	DE-100	LT5Q	CP-10	UC-544	5QA-Q1	
C37	25		47-524	N750-SI 22	TCN-33	CT-AS6J33U	TCT-33		5TCC-G33	N750
C38	47		47CA30A470M	SI 47	DE-470	LT5Q47	GP-47	UC-5447	5QA-Q47	
C39	2.0		47A897	VP0-SI 2.0		LT5Y2	TCO-2	ZT-553		5%
C40	10000		47A234	BPD-01	DD-103	BYA501	ED-01	DC511	5HK-EI	
C41	18		47B480							N80
C43	.047	200	46BT473L3	BPD-05	DF-503	CUB3S47		GEM-4147	3TM-S47	
C43	1000		47A200	BPD-001	DD-102	BYA501	ED-1000	DC521	5HK-DI	
C44	10000		47A234	BPD-01	DD-103	BYA501	ED-01	DC511	5HK-EI	
C45	1000		47A200	BPD-001	DD-102	BYA501	ED-1000	DC521	5HK-DI	
C46	1000		47A200	BPD-01	DD-103	BYA501	ED-01	DC511	5HK-EI	
C47	100		52 100		DE-101	LT5T1	GP-100	UC-531	5GA-T1	Note 1
C48	10000		47A234	BPD-01	DD-103	BYA501	ED-01	DC511	5HK-EI	
C49	820		47-606	BPD-0**8	DE-821	BYAU0T82	ED-820		5GA-T12	
C50	3000		47A295	BPD-00-j	DD-302	BYA502	ED-002	DC522	5HK-D2	
C51	.0039	400	46BR392E4	1464-0039		1R5D39			MS-339	10%
C52	1000		47A586	1464-001		1R5D1	ED-1000	MCD251	MS-21	10%
C53	.047	200	46BT473L3							10%
C54	.047	300	46BT473S3	BPD-05		CUB2S47		GEM-4147	2TM-S47	10%
C55	10000	3000	47-708					GEM-001	20HKD-S1	
C56	100		47CA30A10JM	SI 100	DE-101	LT5T1	GP-100	UC-531	5GA-T1	
C57	47		47CA30A470M	SI 47	DE-470	LT5Q47	GP-47	UC-5447	5QA-Q47	
C58	1000		47-508	SI 1000	DD-102	L10D1	ED-1000	UC-532	5GA-D1	50%
C59	1000		47A200	BPD-001	DD-102	BYA501	ED-1000	DC521	5HK-DI	
C60	.1	200	46BT104L3	P36BN-1	DF-104	CUB2P1			2TM-P1	
C61	.0056	400	46BR562E4	1464-0056		1DR5D56			MS-256	10%
C62	330		47E33D331K	1465-00033	DE-331	SRS733	ED-330		MS-333	10%
C63	680		47E33D681K	1465-00068	DE-681	1R5T68	ED-680		MS-368	10%
C64	.047	600	46BT473Z3	BPD-0047	DE-472	CUB6D47	ED-0047	GEM-6247	6TM-D47	
C65	470		47E33D47LK	1464-00047	DE-471	5R5T47	ED-470		MS-347	10%
C66	.1	200	46BT104L3	P36BN-1	DF-104	CUB2P1		GEM-201	2TM-P1	
C67	300	3000	47-570	BYD-30-100	DD30-101	HVB30T1	HDB-100	DC3031	30GA-T1	
C68	56	2000	47A527		DD30-560	HVA20G56	HD3-56	DC30456	20GA-Q56	
C69	.15	800	46BT154L6	P68BN-15		CUB6P15		GEM-6015	6TM-P15	
C70	.22	600	46BR224L6	P68BN-23		CUB6P22		GEM-6022	6TM-P22	Note 1
C71	.0047	400	46BR472L6	BPD-0047	DE-472	CUB6D47	GP-4700	GEM-6247	6TM-D47	
C72	.047	600		BPD-06	DF-503	CUB6S47		GEM-6147	6TM-S47	Note 2
C73	.1	300	46BT104L3	P36BN-1	DF-104	CUB3P1		GEM-201	3TM-P1	
C74	1000		47A200	BPD-001	DD-102	BYA501	ED-1000	DC521	5HK-DI	
C75	10000		47A234	BPD-01	DD-103	BYA501	ED-01	DC511	5HK-EI	
C76	.22	300	46BT224L3	P36BN-23		CUB2P22		GEM-3022	2TM-P23	

Note 1. Not used in some versions.
Note 2. Some versions use a .22MFD in this application.

PARTS LIST AND DESCRIPTIONS

CONTROLS

ITEM No.	RATING: RESISTANCE	WATTS	REPLACEMENT DATA: CORONADO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1500Ω		25B1428	F1-7	RTV-822		UP152R	Contrast
B	250K			R2-40		* QJ-1043	UR254R	Volume
C	Switch			KB-1			US-26	
R2A	1Meg	↓	25B1424	AB-48		QJ-141	TA256R	Brightness
B	Shaft			AK-3		Not Req.	Not Req.	
R3A	1 5Meg	↓	25B1436	B-742	A47-1.5Meg ②	QJ-138	TA28LR	Vert. Hold
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R4A	5Meg	↓	25B1437	AB-86 ①	A47-5Meg ②	QJ-141		Height with 1Meg stop ▲
B	Shaft			AK-19	RN-3			
R5A	2Meg	↓	25B1435	AB-75	A47-2Meg ②	QJ-139	PTA26L	Vert. Lin.
B	Shaft			AK-19		TQ		
R6A	75K	↓	25-1506			BU-125	PTA15L	Horiz. Hold
B	Shaft					TM2 KH	Not Req.	

* Concentrikit Equivalent K-3 KH, Base Elements & Shafts BT-106, PI-103 (Panel) B13-132, RI-115 (Rear) T6-1 (Switch)

① Use 1Meg resistor in series with right hand terminal and 150V line.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING: OHMS	WATT	REPLACEMENT DATA: CORONADO PART No.	IRC PART No.	NOTES
R7	12K			BTS-12K	
R8	22K			BTS-22K	
R9	10K			BTS-10K	
R10	4700Ω			BTS-4700	
R11	220K			BTS-220K	
R12	2200Ω			BTS-2200	
R13	15K			BTS-15K	
R14	4700Ω			BTS-4700	
R15	330Ω		23X0X33E3	BTS-330	
R16	1Meg		23X1X0105X		
R17	10K		23X0X0103X		
R18	150Ω		23X0X151K	BTS-150	
R19	68Ω		23X0X0560X	BTS-56	
R20	150Ω		23X0X151K	BTS-150	
R21	180Ω		23X0X181K	BTS-180	
R22	6800Ω		23X0X0682X	BTS-6800	
R23	2.7Meg		23X0X2705X	BTS-2.7Meg	
R24	3.3Meg		23X0X3305X	BTS-3.3Meg	
R25	33000	7	24-1123	PW7-3300	
R26	27K		23X0X273X	BTS-27K	
R27	390K		23X0X394X	BTS-390K	
R28	120K		23X0X124X	BTS-120K	
R29	100K		23X0X104X	BTS-100K	
R30	33K		23X0X333X	BTS-33K	
R31	2200Ω		23X0X222X	BTS-2200	
R32	680K		23X0X684X	BTS-680K	
R33	370K		23X0X374X	BTS-370K	
R34	680K		23X0X684X	BTS-680K	
R35	680Ω		23X0X68E4	BTS-680	
R36	27K	1	23X0X273X	BTS-27K	
R37	130Ω		23X0X12E4	BTS-120	
R38	15K		23X0X153X	BTS-15K	

ITEM No.	RATING: OHMS	WATT	REPLACEMENT DATA: CORONADO PART No.	IRC PART No.	NOTES
R39	12K		23X0X0123X	BTA-12K	
R40	18K	1	23X0X0183X	BTA-18K	
R41	68K		23X0X683X	BTS-68K	
R42	100K		23X0X104X	BTS-100K	
R43	100K		23X0X104X	BTS-100K	
R44	100K		23X0X104X	BTS-100K	
R45	100K		23X0X104X	BTS-100K	
R46	470K		23X0X474X	BTS-470K	
R47	180K		23X0X184X	BTS-180K	
R48	1.5Meg		23X0X155X	BTS-1.5Meg	
R49	680Ω		23X0X681X		
R50	680Ω		23X0X681X		
R51	330K		23X0X334X		
R52	1Meg		23X0X105X		
R53	4700Ω		23X0X472X		
R54	1Meg		23X0X105X		
R55	1Meg		23X0X105X		
R56	82K		23X0X823X		
R57	1K		23X0X123X		
R58	68K		23X0X683X		
R59	47K		23X0X473X		
R60	1200Ω 5%		23X2X0123J	BTS-1200 5%	
R61	3300Ω		23X0X332X	BTS-3300	
R62	390K		23X0X394X	BTS-390K	
R63	47K		23X0X473X	BTS-47K	
R64	12000Ω	2	23X4X0123X	BTS-1200	
R65	6800Ω		23X0X682X	BTS-6800	
R66	150Ω		23X2X151K	BTS-150	
R67	4.7Ω	3	24-1109	PW10-4.7	
R68	15Ω		24-1109	PW10-15	
R69	820K		23X0X824X	BTS-820K	

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: CORONADO PART No.	Halldorson PART No.	Merit PART No.	RCA TYPE No.	Rom. PART No.	Stancor PART No.	Thordorson PART No.	Triad PART No.
T1	Horiz. Output	55A333		HVO-134					
T2	Vert. Output	55-303	21J00 ①	A-3823 ①					A 10BX ①
T3A	Yoke-Horiz. (25MH)	53-396	DF807 ①	MDF-92 ①	335IR ①	T90F1B/43 ②	DY-18A ①	25B75 ① Y-26 ①	Y-4L
B	(90°) Vert. (29MH)								NW9
M5	Yoke Cover & Centering Device	21C158-D							YCI ①

① Use 6 to 1 turns ratio.
② Drill new mounting hole(s).
③ Use original yoke damping network, rear cover and centering device.
④ Use original horizontal yoke damping network, if necessary.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	SEC	REPLACEMENT DATA: CORONADO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordorson PART No.	Triad PART No.	NOTES
T4	4400Ω	3-4Ω	55A318	ZJ07 ①	A-3026	A-3677 ①	26B50 ①	S-8X	① Drill one new mounting hole.

SPEAKER

ITEM No.	TYPE: SIZE	FIELD	V. C. IMP	REPLACEMENT DATA: CORONADO PART No.	QUAM PART No.	NOTES
SPI	4"	PM	3-4Ω	85C175A	4A07	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: CORONADO PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	1st. Video IF	51-3187		TV-131	9236	
L3	2nd. Video IF	51-3188				
L3	3rd. Video IF	50-448			4634	15 Microhenries
L4	RF Choke	53A307	19-4006		6140	710 Microhenries
L5	Shunt Peaking Coil	51-3103	19-3660			
L5A	4.5MC Trap	51B1996		TV-130	6154 *	396 Microhenries, wound on 3900Ω resistor
B	1st. Sound IF	51-3101	19-4400 *		6130 ▲	180 Microhenries, wound on 27K resistor
L7	Shunt Peaking Coil	51A1184	19-3180 ▲			
L9	2nd. Sound IF	51-3166				
L10	Quadrature Coil	51A1857				
L11	RF Choke	53-343				7.5 Microhenries, IRC part #CLA

* Parallel with 3900Ω resistor
▲ Parallel with 27K resistor

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES: PRI.	SEC	REPLACEMENT DATA: CORONADO PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Rom PART No.	Thordorson PART No.	NOTES
L12	220		51-3169	19-1575		6210 *			H3-4	7.5-30.5 Millihenries

* Enlarge mounting hole, 3900MMF capacitor may have to be used in place of .0056MFD capacitor.

FILTER CHOKE

ITEM No.	RATINGS: TOTAL DIRECT CURRENT	D.C. RESISTANCE	INDUCTANCE @ CURRENT 1000 (%)	REPLACEMENT DATA: CORONADO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordorson PART No.	Triad PART No.
L13	.340A	21Ω	.31 HY.	56A264	C50H ①	C-29H ①	C-3238 ①	26C44 ①	C-37Z

① Drill one new mounting hole.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	CORONADO PART No.	REPLACEMENT DATA
XI	Ant. Isolation	470MMF, 470K		Centralab RC-47
K2	Sync Take-off Coupiate	270MMF, 10000MMF, 25MMF, 2.2Meg, 330K	48A066	Aerovox PA533 Centralab PC-323 Sprague ST-3

RECTIFIERS

ITEM No.	RATING: CURRENT (Measured)	REPLACEMENT DATA: CORONADO PART No.	FEDERAL PART No.	GENERAL ELECTRIC PART No.	INTERNATIONAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.	NOTES
M1	280A	27C238 ①	1023A ①	1N1007 ②	RS350SL ①	6B350 ①	350A ①	
M2		27C228 ①	1215 ① ②		1T1 ① ②			

① Selenium type. ② Germanium type. ③ 2 required.

CRYSTAL DIODES

ITEM No.	ORIG TYPE	REPLACEMENT DATA: CORONADO PART No.	CBS PART No.	SYLVANIA PART No.	NOTES
M3	1N295	19C1960	1N80	1N60	Video Detector (Pigtail)

MISCELLANEOUS

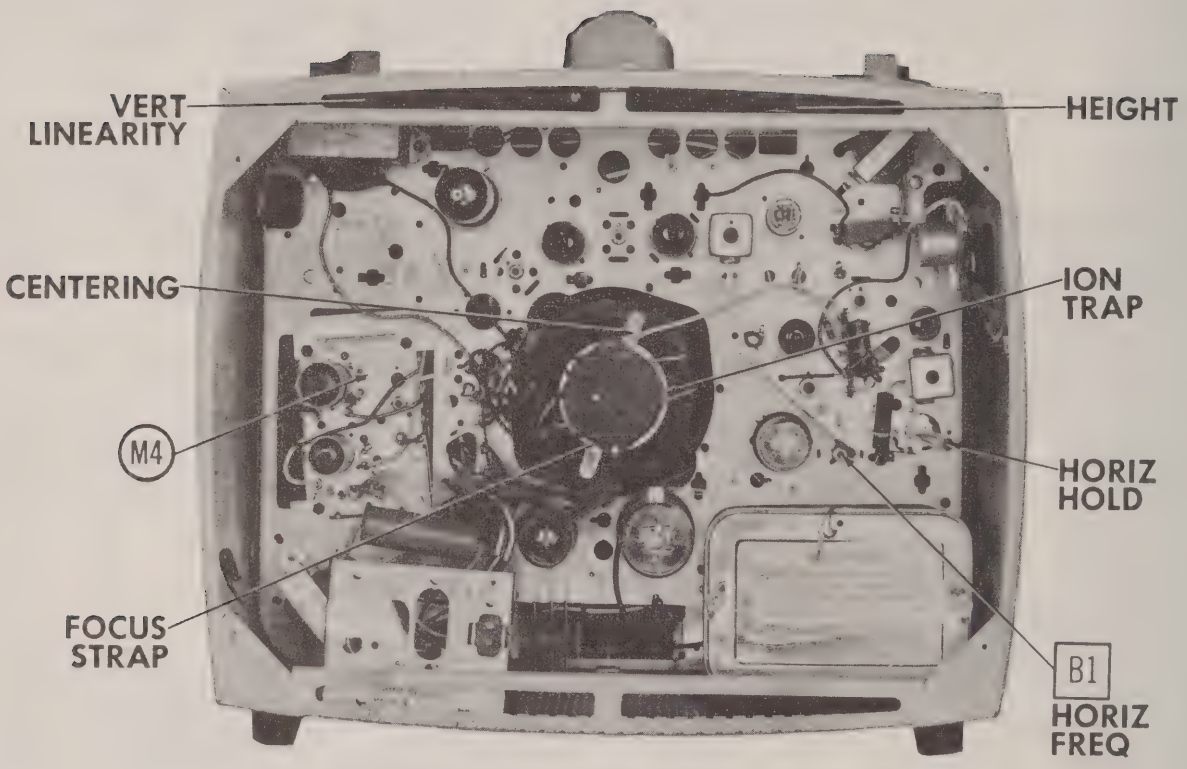
ITEM No.	PART NAME	CORONADO PART No.	NOTES
M4	Tuner	1-3453	VHF
M5	Centering Device	21C158-D	Includes rear yoke cover
M6	Ion Trap	21B198	

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO	DESCRIPTION
Safety Glass	22B555	
Cabinet	366A004	
Handle	34LA80026	Complete Assembly
Knob	15B1055	Contrast (Clear)
Knob	15B1154	Fine Tuning (Clear)
Knob	21SA024	Channel Selector (Ivory)
Knob	15B094	Channel Selector (Beige)
Knob	21SA026	Volume-ON-OFF (Ivory)
Knob	15B140	Volume-ON-OFF (Beige)
Knob	21SA027	Vert. Hold (Ivory)
Knob	15B1144	Vert. Hold (Beige)
Knob	21SA028	Brightness (Ivory)
Knob	15B1145	Brightness (Beige)

CORONADO MODEL TV3-9401A



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

1. Turn the set on and tune in a TV station, preferably with a test pattern.

2. Set the horizontal hold control at the center of its range and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.

3. Check horizontal sync on other stations and if necessary, retouch B1 for best sync action on all channels.

PHOTOFACT* Folder

CRESCENT
MODELS C606, C607, C708, C709

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

CRESCENT
MODELS C606, C607, C708, C709

CRESCENT
MODELS C606, C607, C708, C709

GENERAL INFORMATION

The Crescent Models C606, C607, C708, and C709 Record Changers are designed for automatically changing as many as ten 12" records, twelve 10" records, ten 7", 33 1/3 RPM records, or fifteen 7", 45 RPM records, or any assortment of ten 7", 10" and 12" records of the same speed.

The Crescent Models C606 and C607 are three speed changers, 33 1/3, 45 and 78 RPM. The Crescent Models C708 and C709 are four speed changers, 16 2/3, 33 1/3, 45 and 78 RPM.

Seven inch, 45 RPM records can be played on these changers by inserting an adaptor in the record or by using a special 45 RPM spindle that is available as an accessory.

These changers automatically shut off after the last record has been played.

Connect these units only to an outlet supplying 117 volts, 60 cycle AC unless otherwise specified.

MANUFACTURED by:

CRESCENT INDUSTRIES, INC.
5900 W. TOUHY AVENUE
CHICAGO 31, ILLINOIS

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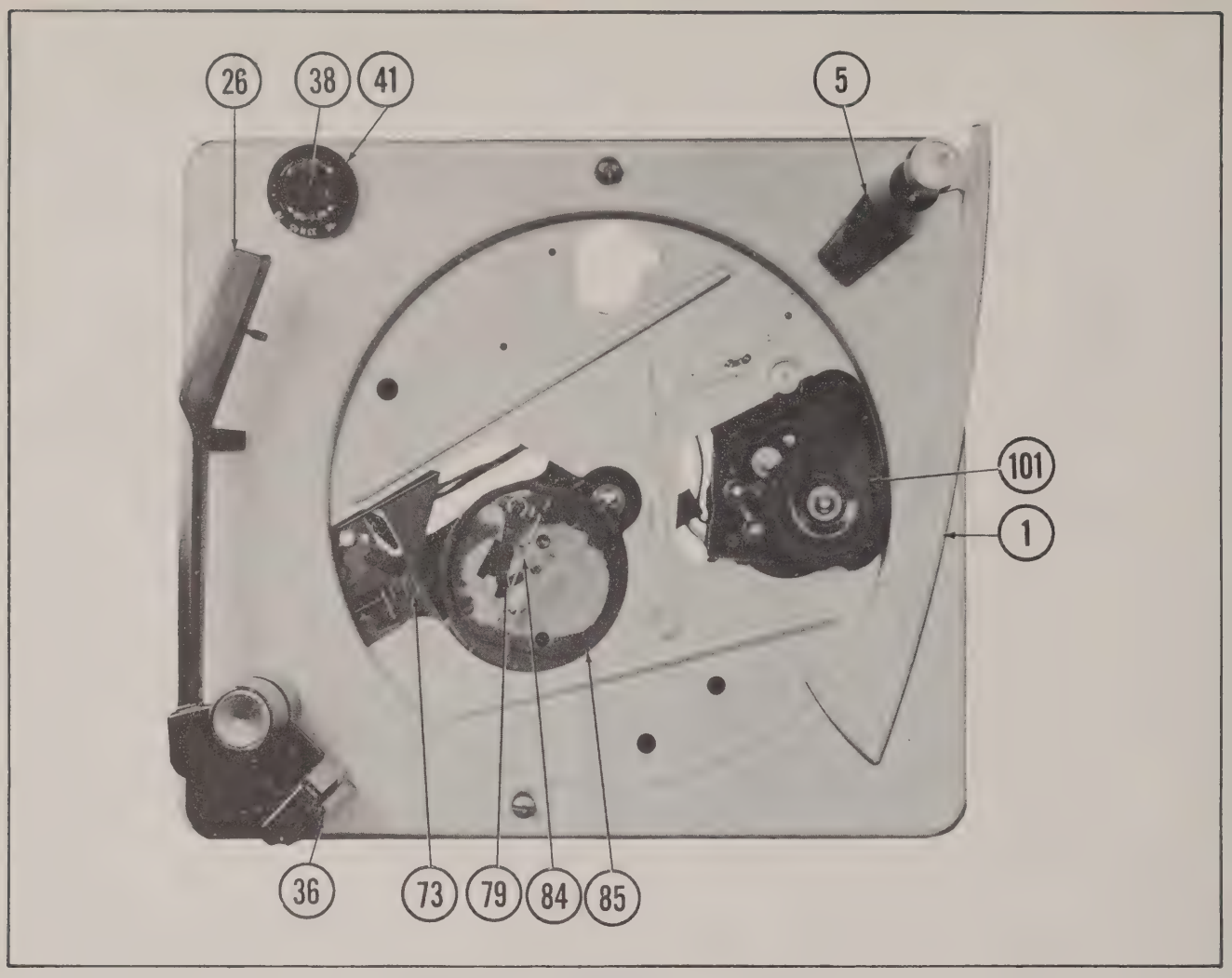

FIGURE 1

Difference In Crescent Changers:

The record changers are similar mechanically the major differences being the motors used for three speed changers, and the motor used in the 4 speed changers.

NOTE: For information concerning the above, refer to exploded view and parts list.

PREPARING FOR OPERATION

Shipping Bolts-

Before placing in operation, the changer must be floating freely on the mounting springs (45). During shipment the mechanism is secured by means of two shipping bolts (43 and 44). To float the changer turn the two shipping bolts in a clockwise direction as far as possible.

Leveling Record Changer-

For best results, the record changer should be level. Use a suitable level on the baseplate. Adequate shims can be used under the baseplate or cabinet to achieve perfect level.

Loading-

1. Lift straight up on the pressure arm cap until the pressure arm (1) clears the spindle (23). Swing the pressure arm to the left until its locating pin drops into the locating groove of the pressure arm housing (5).

NOTE: 16, 33 1/3, 45 and 78 RPM records cannot be intermixed. The speed control knob (41) must be reset for each type of record.

2. Place records on spindle (23) and lower to offset shelf. Hold records level and replace pressure arm (1) over the records.

To Play 78 RPM Records-

1. Speed control knob (41) must be in the "78" position.

2. On changers using a turnover needle, the turnover lever must be set for "78".

3. To start the changer turn "On-Off" knob (38) to "Rej." position and release slowly to "On" position. The Crescent Changer will now operate automatically until the last record has been played, at which time the tone arm will return to its rest and the mechanism will shut-off.

NOTE: Some changers do not employ the automatic shut-off mechanism.

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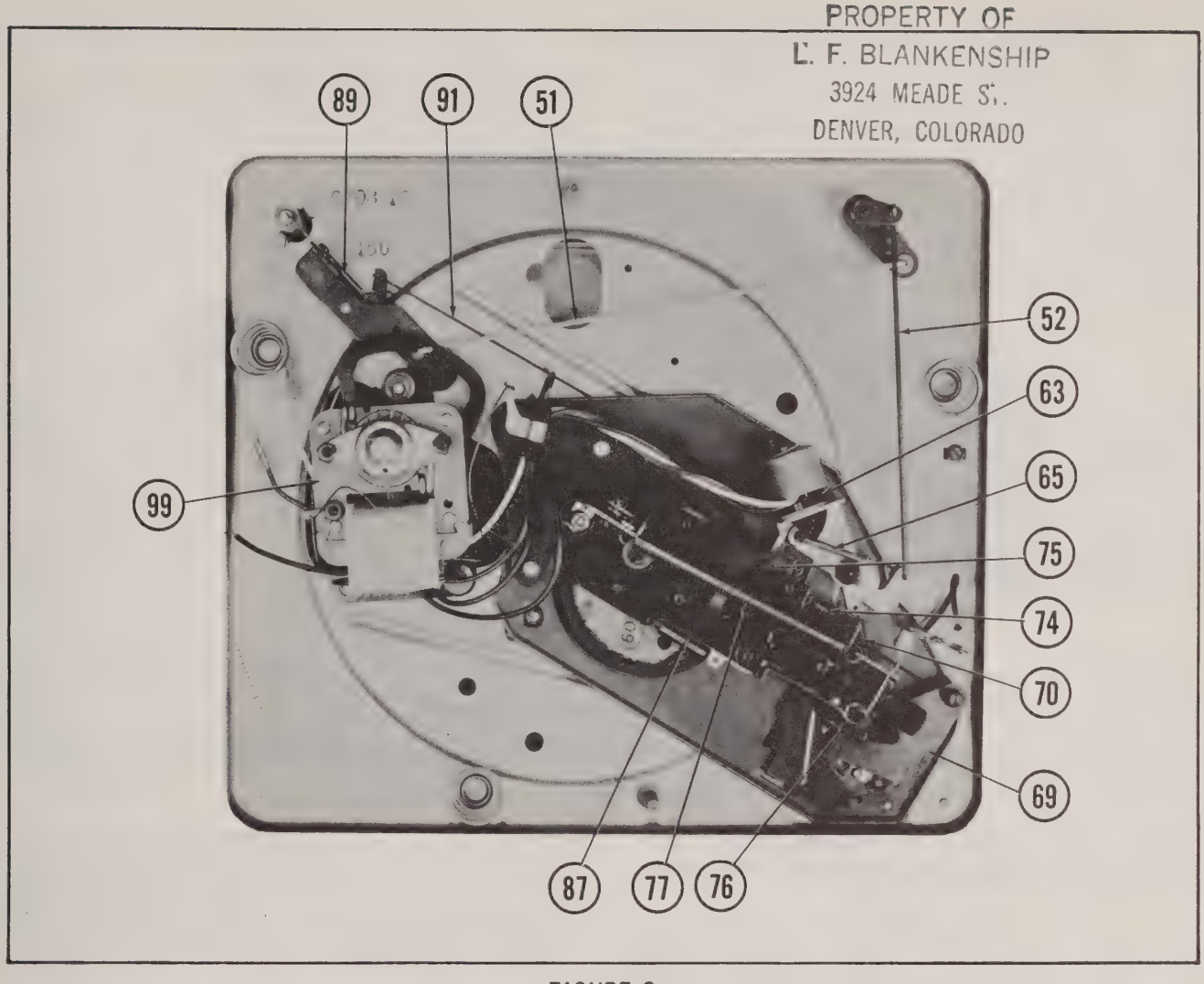

FIGURE 2

To Play 33 1/3 RPM Records-

1. Speed control knob (41) must be in the "33" position.

2. On changers using a turnover needle, the turnover lever must be in "LP" position.

To Play 45 RPM Records-

1. Speed control knob (41) must be in the "45" position.

2. On changers using a turnover needle, the turnover lever must be in "LP" position.

3. 45 RPM records are manufactured with a 1 1/2" center hole. If used with the conventional spindle (23), an adaptor must be inserted in the record: however, a special spindle is available that eliminates the need of adaptors.

45 RPM Spindle Operation Instructions-

1. Lift up on pressure arm (1) and turn it to the left as far as possible.

2. Be sure tone arm is in its rest position.

3. Grasp spindle between thumb and forefinger; with forefinger on actuator (109), squeeze actuator slightly and place spindle on center post (23) with actuator facing the selector housing (36). Turn the spindle slightly to the left, or right, until the slot in the bottom of the spindle lines up with the gate on center post (23). Push down on the spindle until it comes to rest on the turntable. The 45 RPM spindle is now ready to operate.

To Operate-

1. Place a stack of records, up to 15, on the spindle. Turn pressure arm (1) to the right and lower it onto the records.

2. Proceed as described "To Play 45 RPM Records".

Rejecting-

To reject a record at any time while changer is operating, turn "On-Off" knob (38) to "Rej." and slowly release to "On" position.

Neutral Position-

When the changer is to be out of service for any length of time, it should be left in the neutral position. This position is identified by the letter "N" engraved on the baseplate or speed control knob (41). When in this position the motor shaft and idler wheel do not

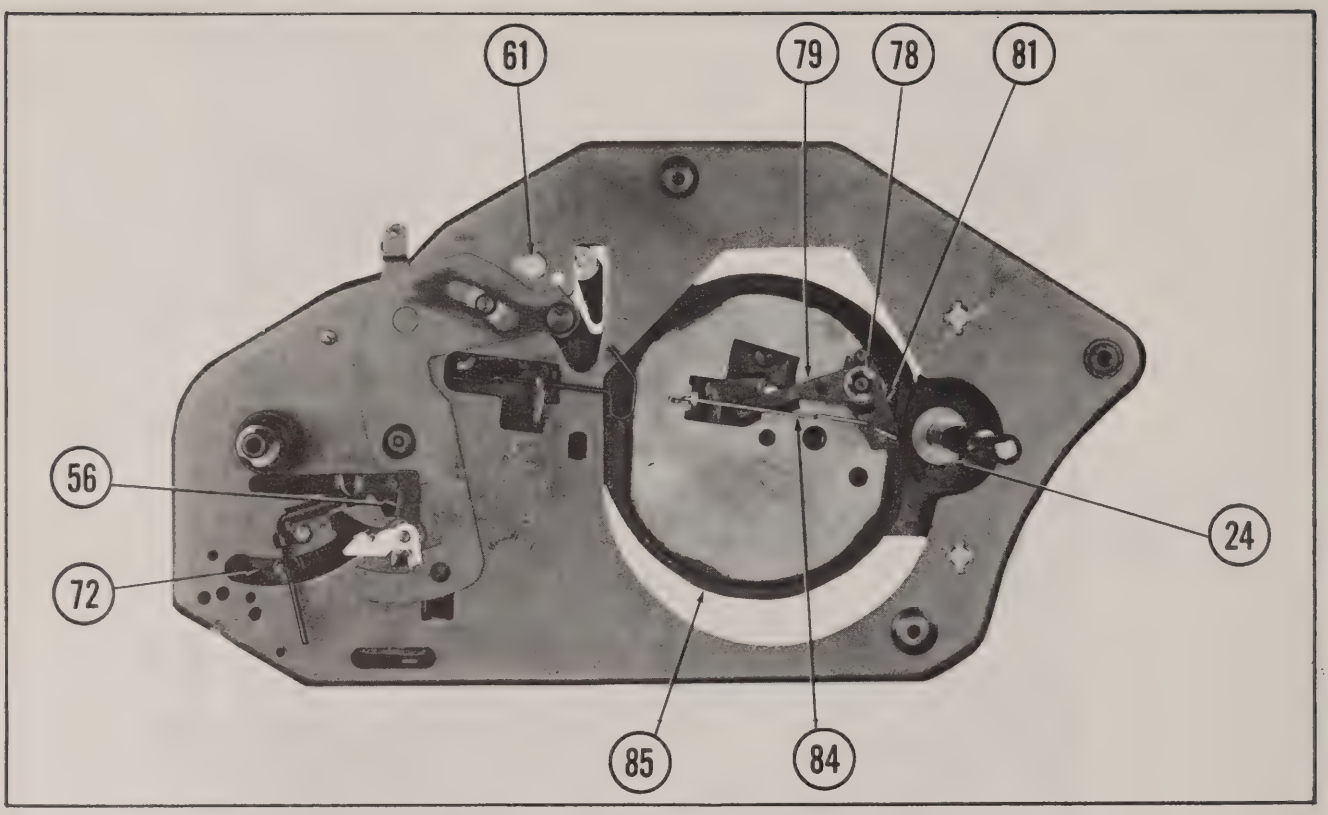

FIGURE 3

come in contact with the drive wheels, thereby preventing any flat spots from developing on the rubber tires.

CHANGE CYCLE

This changer is provided with what is known as a velocity trip mechanism. The change cycle is started by the faster inward motion of the tone arm when the needle enters the lead-out groove at the end of a record.

The tone-arm assembly and the tone-arm actuating lever (69) are secured at opposite ends of the tone arm shaft so that they move in unison. As the tone arm nears the end of a record, the tone-arm actuating lever (69) pushes the push trip rod (73), which, in turn, engages push trip rod (84) rotating the pawl locator (79) to move the trip pawl (81) toward the turntable hub by action of the thrust washer (80). While a record is playing, the small motions of the trip pawl (81) are not sufficient to trip the mechanism because, on each revolution of the turntable, the wiping action by the trip cam (point "A" on exploded view) moves the trip pawl (81) back far enough to clear the trip cam.

When the needle enters the lead-out grooves, causing the tone arm to advance rapidly toward the spindle, the trip pawl (81) is moved far enough to definitely engage the trip cam (point "A" on exploded view). As the trip cam engages the trip pawl (81), cam wheel (94) is pushed in a counter-clockwise direction until it makes contact with the serrated portion of the turntable hub. Since the turntable is rotating, the eccentric cam wheel (85) also rotates, pushing the main slide (75) away from the spindle.

As the main slide (75) begins to move, the cam surface (point "B" on exploded view) pushes the lift shaft (58) upward, raising the tone arm clear of the record. At the same time, spring (76) contacts the tone-arm actuating lever (69) swinging the tone arm clear of the turntable.

As the cam wheel (85) continues to rotate, the positioning stud on the main slide (75) contacts and moves the pawl locator (79) across the cutout in the cam wheel (85), resetting the trip pawl (81) for the next change cycle.

At the same time, the lift rod (55) rides down the incline on the rear of the main slide (75), allowing the selector lever assembly (13) to pivot upward and the friction slide (20) to be pushed downward by return spring (19). As the selector lever assembly (13) pivots outward, the positioning rod (17) drops down in front of the tabs on the lower selector assembly (71).

The front edge of the slot (point "C" on exploded view) in the main slide (75) now contacts the ejector link on the bracket assembly (93A). The ejector link moves the push-off shaft (23A) upward, actuating the spindle assembly (23), dropping a record to the turntable.

Simultaneously, the stud on the tone-arm actuating (69) engages the lower selector assembly (71) moving it clear of the locking lever (54). The main slide (75), at this time, starts moving toward the spindle.

If a 7" record is being changed, the positioning rod (17) remains in front of the 12" selector lever and the 10" selector lever (all part of item (71), preventing them from engaging with the stud on the tone-arm actuating lever (69). The 7" selector lever is now

free to move against the stud on the tone-arm actuating lever (69).

If a 10" record is being changed, the edge of the record strikes the selector lever arm on the upper selector assembly (13), moving it down just far enough to lift the positioning rod (17) clear of the 10" selector lever (part of item 71). In this position, the 12" selector lever is locked in position and the 7" and 10" selector levers contact the stud on the tone-arm actuating lever (69). Since the set down step in the 10" selector lever is nearer the stud, the stud will engage the set-down step in the 10" selector lever first, assuring the proper set-down point for 10" records.

If a 12" record is being changed, the edge of the record strikes the arm which lifts the lift rod (17) clear of all three selector levers. In this position, the stud on the tone-arm actuating lever (69) engages with the set-down step in the 12" selector lever first, positioning the tone arm for the 12" set-down point.

As the main slide (75) continues moving toward the spindle, one of the selector levers, which has been positioned by the size record being changed (see above), engages the stud on the tone arm actuating lever (69) pushing the tone arm in over the turntable, by pressure applied by the tone arm positioning spring (70), until the stud engages the set-down step in the selector lever (71), stopping the inward travel of the tone arm. The tone arm is then lowered to the lead in groove of the record as the lift shaft (58) rides down the cam surface (point "B" on exploded view) on the main slide (75).

As the tone arm is lowered to the record, the stud on the rear of the main slide (75) contacts the lower selector assembly (71) and pushes it back far enough to release the set-down step from the stud on the tone-arm actuating lever (69), permitting the tone arm to ride freely across the record.

At this time, the stud on the rear of the main slide (75) pushes the locking arm (54) which in turn, moves the locking lever (54) far enough to engage with the pin on the lower selector assembly (71) thereby locking the lower selector assembly in the out-of-cycle position.

As the main slide nears the end of its travel, the index pin on the bottom of the cam wheel (85) rides into the detent of the cam latch (75A), preventing the cam wheel (85) from engaging with the turntable hub until the next change cycle is started.

As soon as the last record has been dropped, the arm (1) drops below the shelf on the spindle assembly (23) and the pressure arm shaft contacts the shut-off lever on the automatic shut-off assembly (90). When the last record has finished playing, the change cycle starts again; however, this time, the rest position lever (57) is pivoted inward due to the action of the shut-off rod (91), which, in turn, was actuated by the shut-off spring (89) when the pressure arm shaft contacted the shut-off lever. As the rest position lever (57) pivots inward, the stud on the bottom moves against the cam surface on the reject lever (75B) and the tab at the opposite end moves into the path of the stud on the tone-arm actuating lever (69). As the tone arm swings outward from the turntable, the stud on the tone-arm actuating lever comes in contact with the tab on the rest-position lever (57), stopping the tone arm directly over the arm rest, thereby preventing the stud on the tone-arm actuating lever (69) from traveling far enough to unlock the lower selector assembly (71). At this time, the stud on the rest-position lever (57) has moved behind the cam surface on the reject lever (75B), and as the main slide (75) moves forward, the stud contacts the cam surface from the rear, forcing the reject lever (75B) toward the "On/Off" switch assembly (63). The lift shaft (58) now rides down the cam surface (point "B" on exploded view) on main slide (75), lowering the tone arm to the arm rest. Simultaneously, the reject lever (75B) contacts the stud on the "On-Off" switch assembly (63), which in turn, is moved far enough to shut the switch off.

Operation of 45 RPM Spindle Mechanism-

The center post (23) functions the same as before the 45 RPM spindle was placed on the changer. As the center post (23) is actuated, its ejector lever contacts the actuator (109) on the 45 RPM spindle and pushes it. This causes the separators (111) to move out which in turn, pull bolts (112) in. As the bolts recede, the separators (111), mounted above the bolts, move out and separate the lower record of a stack and support the remaining records, while the lower record drops to the turntable.

The ejector lever on center post (23) then moves to its rest position, allowing actuators (109) on the 45 RPM spindle to return with it by pressure applied by spring (114), causing separators (111) to move in and bolts (112) to move out. This action permits the bottom record of a stack to drop from the separators to the bolts.

ADJUSTMENTS

Needle Set Down-

The set-down point of the needle is adjusted by means of the set-down adjustment screw (31). Turn this screw, adjusting the tone arm for the correct set down point on a 10" record. When the correct set-down point is obtained for the 10" position the 12" and 7" set down points will also be correct.

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Tone Arm Height Adjustment-

The tone arm height is adjusted by means of the height adjustment screw (34). To raise the height of the tone arm, turn this screw counter-clockwise. To lower the tone arm, turn clockwise. The tone arm height should be adjusted so the tone arm misses the underside of a record resting on the spindle shelf.

Needle Pressure-

The needle pressure should be between 8 and 12 grams. Adjustment can be made by turning the small gear (28A) (See Exploded View). To increase the needle pressure, release gear (28A) by raising the pawl (32A), and then readjust to the correct pressure by rotating the gear toward the rear of the changer. Moving the gear toward the rear of the changer decreases needle pressure.

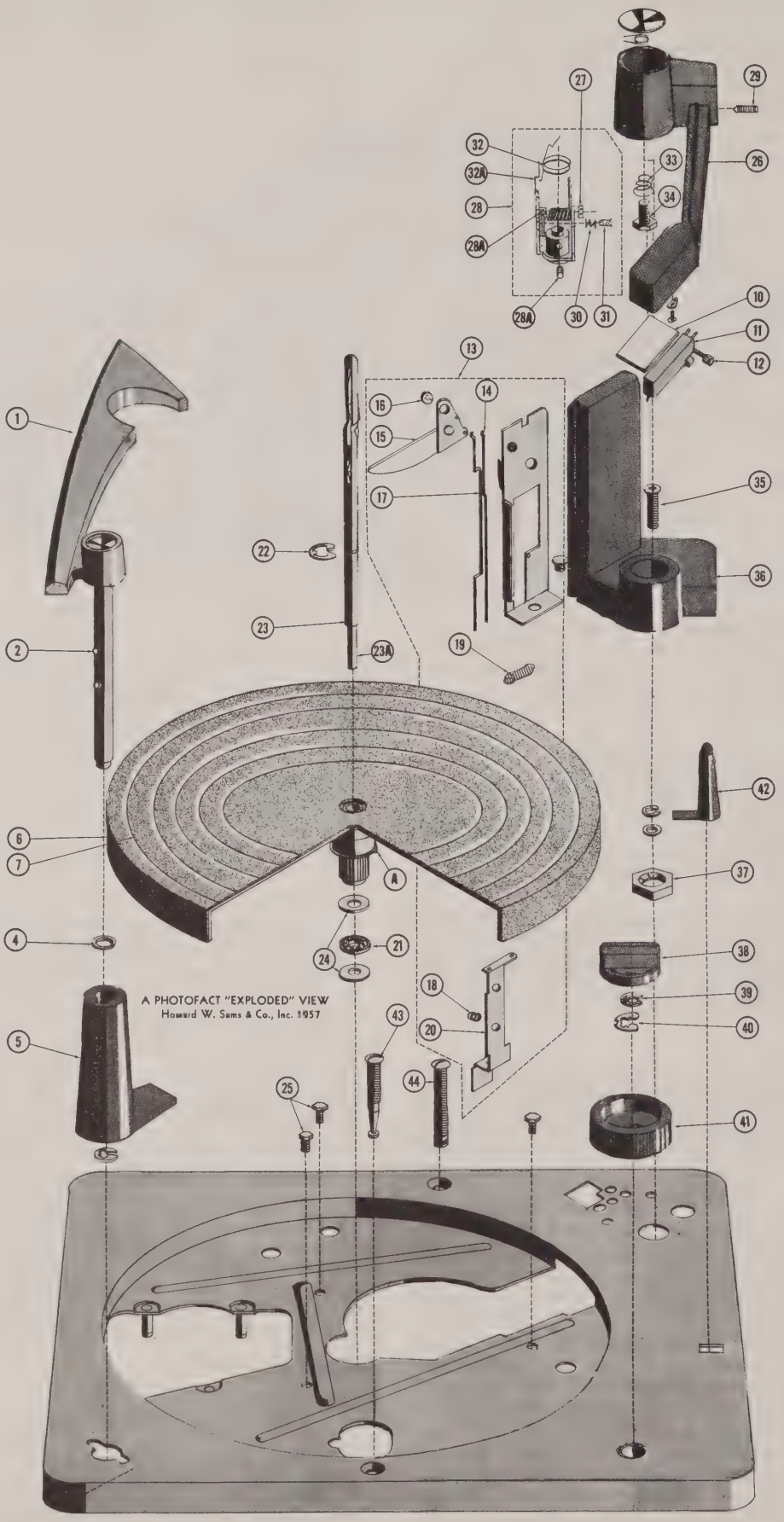


FIGURE 4A. EXPLODED VIEW OF PARTS ABOVE BASEPLATE.

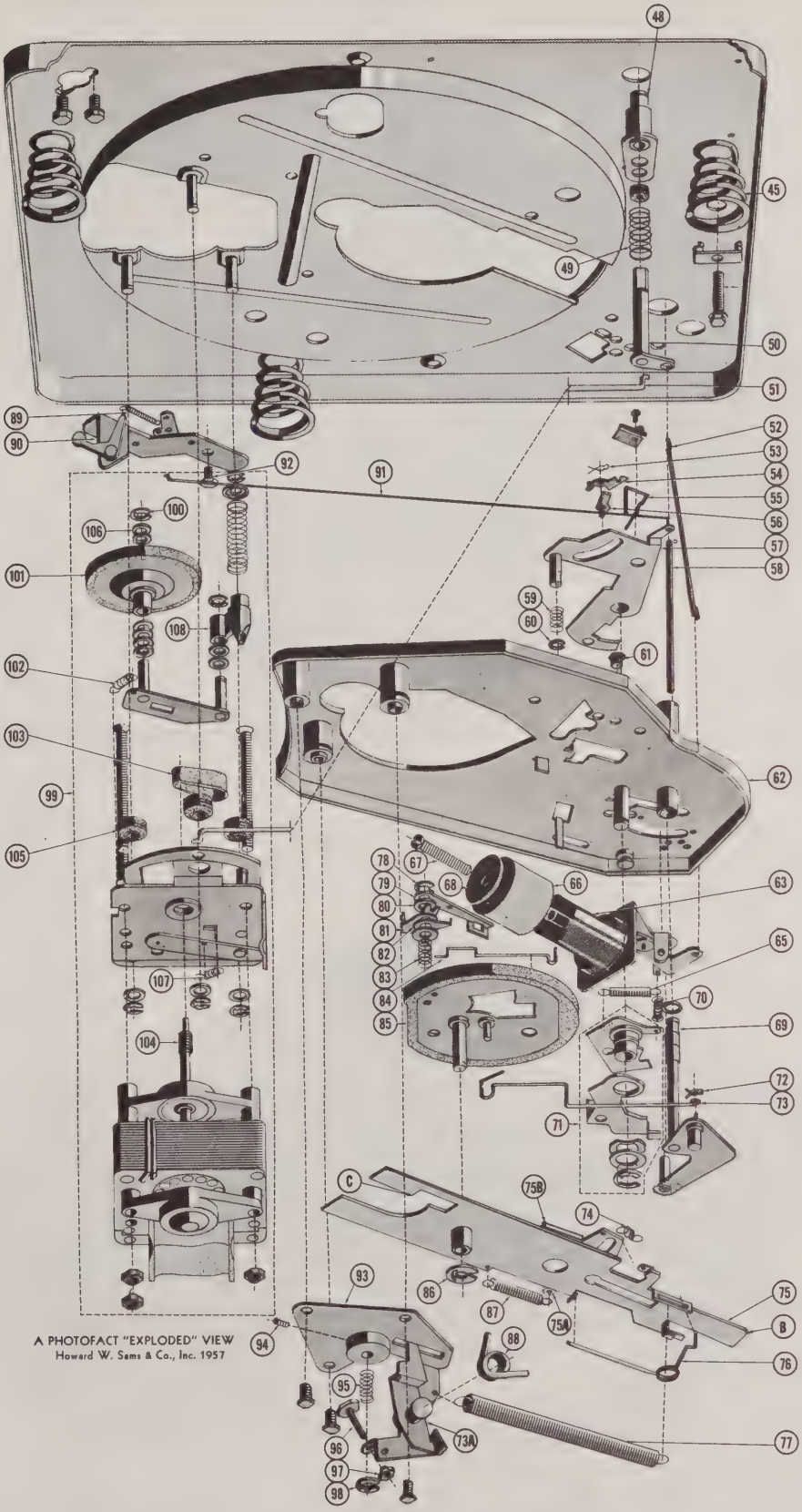


FIGURE 4B. EXPLODED VIEW OF PARTS BELOW BASEPLATE.

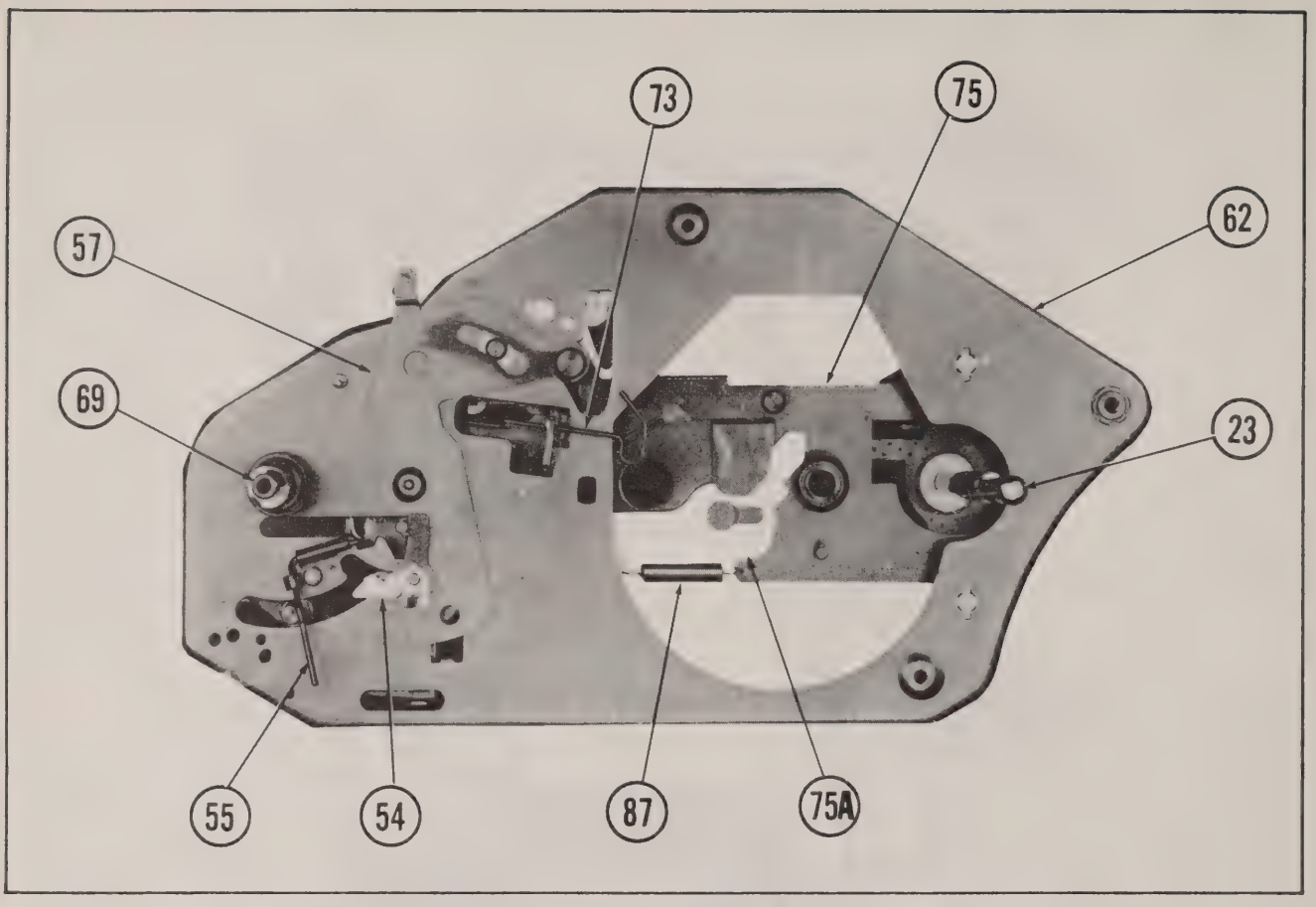


FIGURE 5

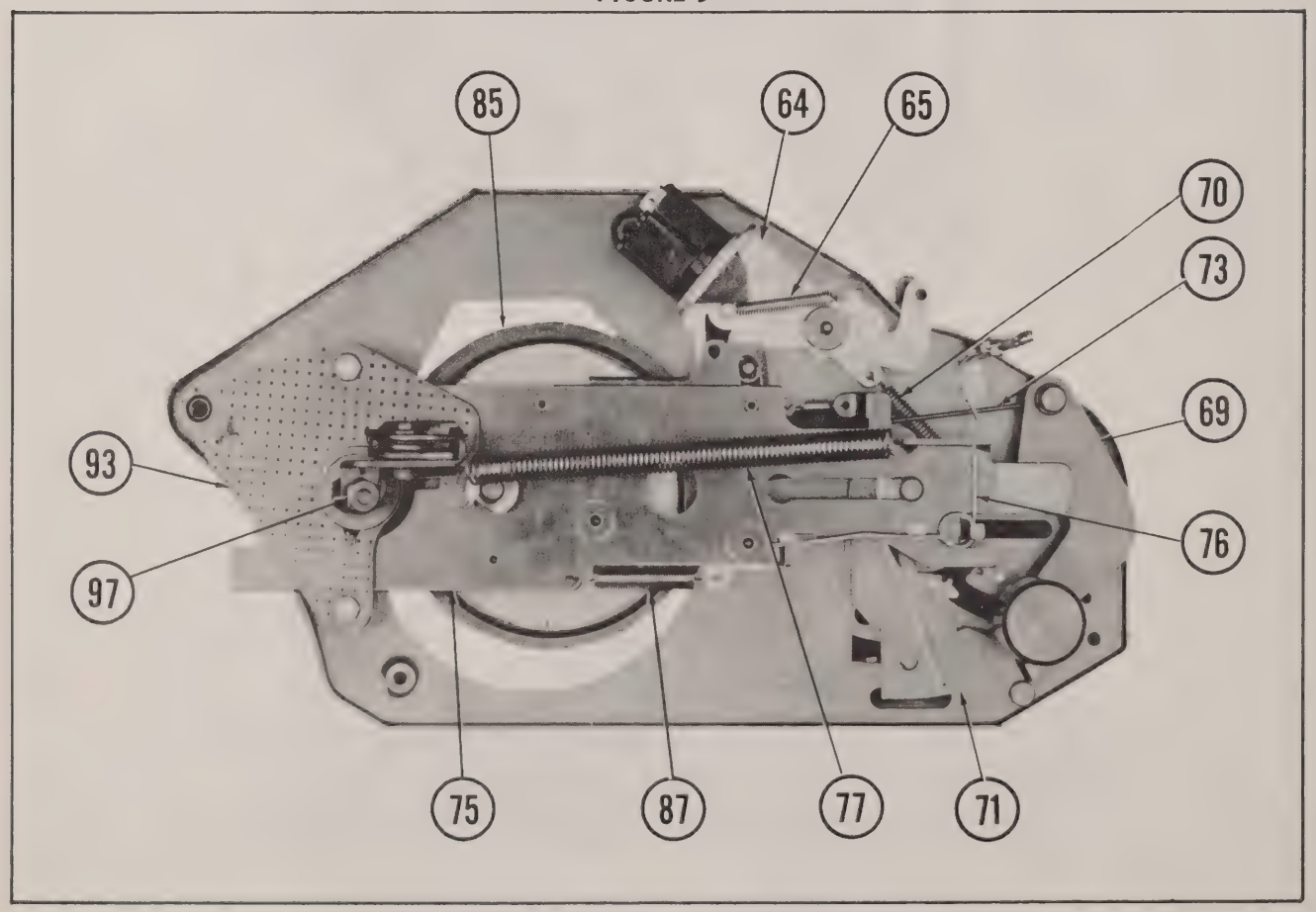
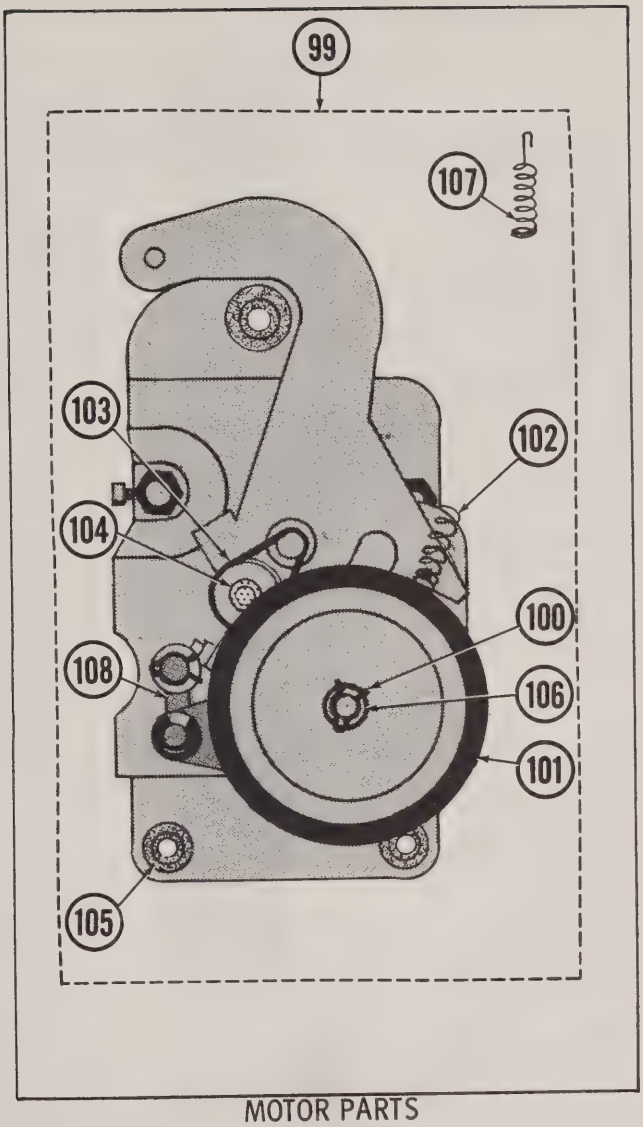


FIGURE 6

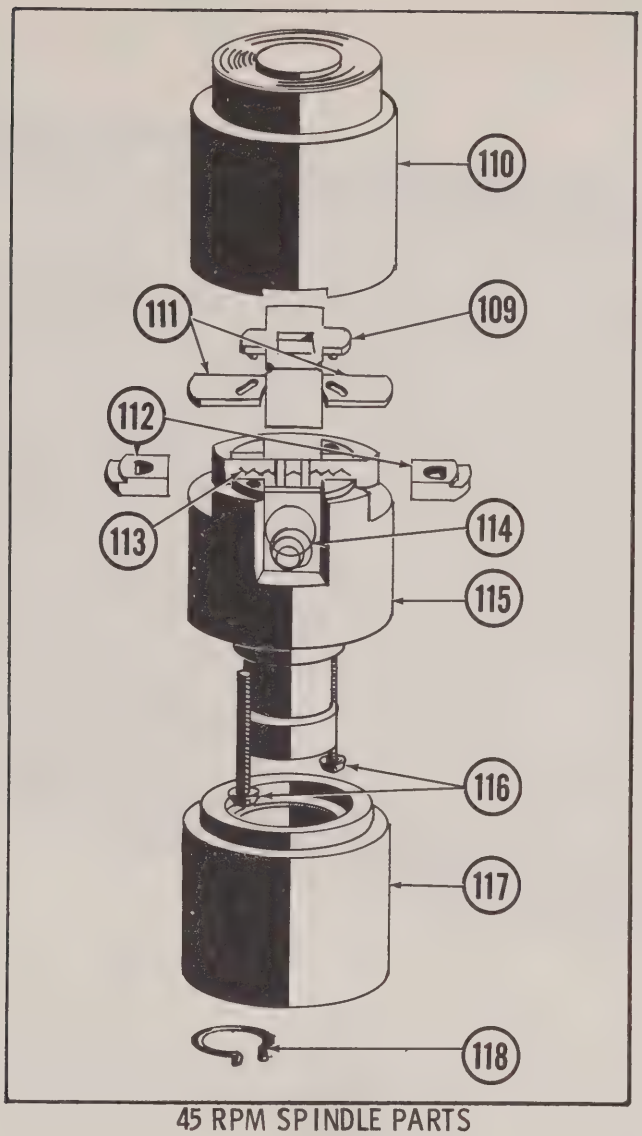


MOTOR PARTS

MECHANICAL PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1	012379	Pressure Arm Assembly	21	290010	Bearing, Turntable (Used In Models C606 and C607)
2	460201	Groove Pin			
4	580106	Shock Washer, Cork	22	460114	Washer, "C" Retainer
5	300054-030	Pressure Arm Housing	23	011203	Spindle Assy.
6	012556	Turntable and Mat Assy. Used In Models C606 and C607	24	580102	Thrust Washer, Turntable (2) (Used In Models C606 and C607)
	013057-2	Turntable (Inc. Mat) Used In Models C708 and C709	25		Screws
			26	300035-031	Tone Arm (Used In Models C606 and C607)
7	320085	Mat, Turntable (White) Used In Models C606 and C607		012359	Tone Arm (Used In Models C708 and C709)
8	120020	Insert, Tone Arm			
9	420180	Spring, Retaining	27	590003	Nut, Hex #8-32
10	320069	Sleeve, Cartridge	28	012361	Tone Arm Pivot Assy.
11	720091	Cartridge, Sonotone #2T-LBS	28A	600213	Screw, Set #8-32 x 3/16"
12	720055	Stylus	29	200337	Screw, Pivot
13	011968	Upper, Selector Assy. (Inc. Items 14 Thru 20)	30	420076	Spring, Friction
			31	600165	Screw, 6-40 x 1/4" Rd. Hd.
14	100985	Positioning Rod	32	420069	Spring
15	011966	Selector Lever and Swivel Assy.	33	420085	Spring, Height Adj. Screw, Retaining
16	460144	Retaining Ring			
17	100817	Lift Rod	34	200356	Screw, Height Adj.
18	420097	Clutch Compression Spring	35	600306	Screw, #8-32 x 5/8" Phil. Rd. Hd.
19	420096	Spring, Pull Down			
20	100984	Friction Slide	36	310325	Upper Selector Arm Housing

Ref. No.	Part No.	Description
37	580003	#8 Ext. Tooth Lockwasher
38	013024	Knob, Reject
39	580006	"C" Washer, Speed Control Shaft Retainer
40	460067	"C" Washer, Speed Control Shaft Retainer
41	310305	Knob On-Off and Speed Control
42	310324	Rest, Tone Arm
43	600272	Screw, Mtg. (Model C606 Only)
	600199	Screw, Mtg. (Model C607 Only)
44	600271	Screw, Mtg. (Model C606 Only)
45	420092	Compression Springs (3)
48	011663	Speed Control Shaft and Lever Assy.
49	420055	Spring, Anti-Rattle
50	010897	On-Off Shaft and Lever Assy.
51	100738	Speed Control Rod
52	100455	Shut Off Rod (Short)
53	420067	Retainer, Locking Lever
54	100842	Locking Lever
55	100451	Lift Rod
56	100438	Locking Arm
57	100432	Lever, Rest Position
58	010909	Lift Shaft Assy.
59	420057	Spring, Shut-Off Index Stud
60	460144	"C" Washer, Index Stud
61	600192	Screw #6-32 x 3/16" Hex.
62	010913	Sub Base Plate Assy.
63	010911	On-Off Switch Assy.
65	420058	Spring, On-Off Switch
66	130091	Switch Cover and Liner
67	600169	Screw, #4-24 x 3/8" Bind, Sltd. Hd.
68	580110	Fibre Washer
69	010912	Tone Arm Actuating Lever Assy.
70	420066	Tone Arm Positioning Spring
71	012109	Lower Selector Assy.
	010910	Lower Selector Assy. (Used On Earlier Production Models)
72	460063	Hair Pin Clip, Push Trip Rod Retainer
73	100450	Push Trip Rod (Long)
74	420065	Reject Lever Spring
75	100841	Main Slide
76	420054	Spring, Tone Arm Actuating Lever Return
77	420063	Slide Spring
78	460103	Retainer, Cam Wheel Assy.
79	100435	Pawl Locator
80	320036	Clutch Disc
81	100499	Trip Pawl (Used In Models C606 and C607)
	100449	Trip Pawl (Used In Models C708 and C709)
82	100472	Pressure Plate (Used In Models C606 and C607)
	100930	Clutch Arm (Used In Models C708 and C709)
83	420068	Spring, Clutch
84	100779	Push Trip Rod (Short)
85	010923	Cam Wheel (Used In Models C606 and C607)
	013233	Cam Wheel (Used In Model C708-10)
	013234	Cam Wheel (Alternate Part For C606 and C607)
86	580003	"C" Washer, Cam Wheel Retainer
87	420064	Cam Wheel Index Spring
88		Spring
89	420062	Automatic Shut Off Spring
90	010894	Automatic Shut Off Assy.
91	100453	Automatic Shut Off Rod
92	600137	Screw, #8-32 x 1/4" Hex.
93	010916	Bracket Assy.
94	600213	Set Screw, #8-32 Allen Hd. (2)
95	420099	Push Off Shaft Spring
96	200217	Adj. Screw #8-32 x 11/32"
97	590002	Nut, #8-32 Hex Hd.
98	580005	Washer "C" Retainer
99	011417	Motor and Drive Assy. (Parts For Motor Stamped 011417) (Used In Models C606 & C607)
101	011887	Drive Wheel,Thick
101A	011888	Idler Wheel,Thin
102	420158	Spring, Idler Wheel Tension
105	320066	Mounting Bushings (3)
106	580163	Fibre Washer (2)
99	012982	Motor and Drive Assy. (Inc.100 to 108) (Parts For Motor Stamped 012982) (Used In Models C708 and C709)
100	460225	Hair Pin Retainer
101	013240	Drive Wheel
102	420192	Spring, Drive Tension
103	320100	Belt
104	420194	Friction Spring
105	320102	Mounting Grommet (3)
106	580216	Fibre Washers (2)
107	420196	Spring, Index Tension
108		Idler Wheel Linkage
99	012979	Motor and Drive Assy. (Parts For Motor Stamped 012979)
100	460226	Hairpin Retainer
101	013241	Drive Wheel
102	420193	Spring, Drive Tension
103	320101	Belt
104	420195	Friction Spring
105	320103	Mounting Grommet (3)
106	580217	Fibre Washer
107	420197	Spring, Index Tension
108		Idler Wheel Linkage

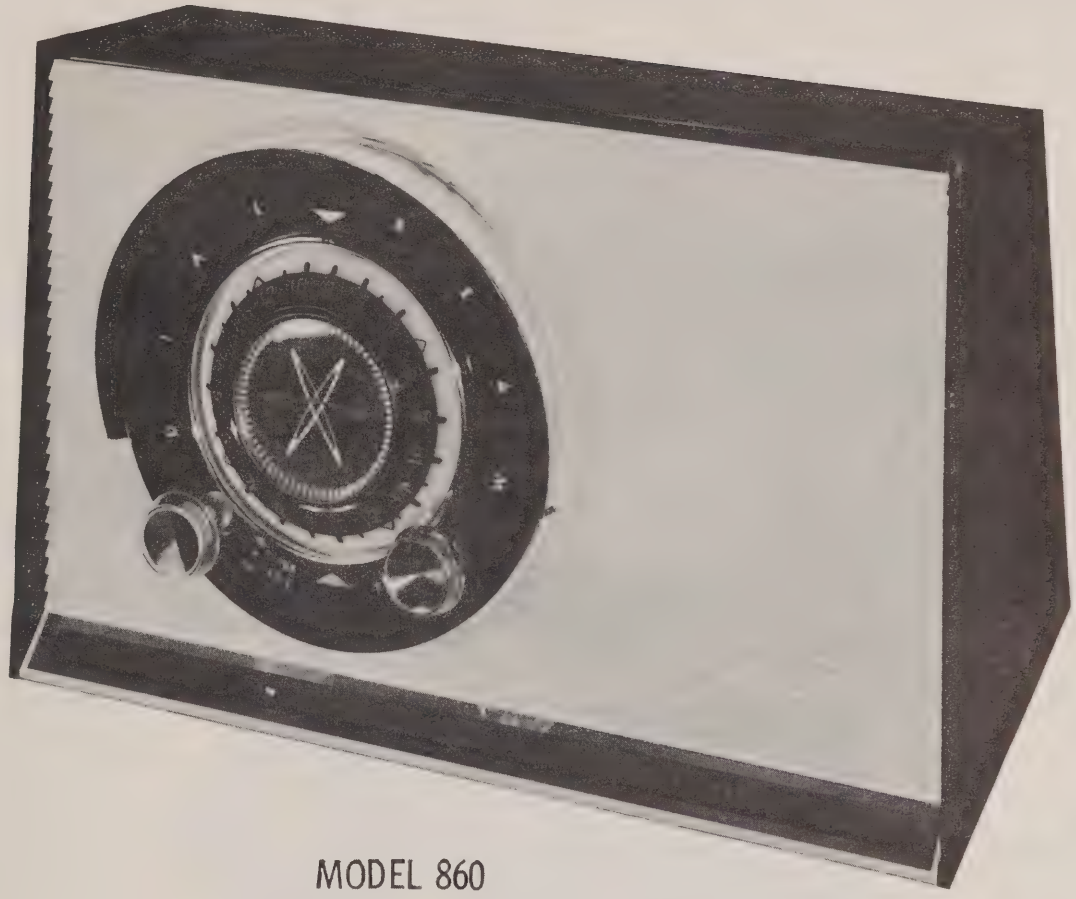


45 RPM SPINDLE PARTS

MECHANICAL PARTS LIST (Con't.)

Ref. No.	Part No.	Description		Ref. No.	Part No.	Description
109	011198	Actuator		115	300031-054	Spindle Housing
110	310376	Spindle Nose		116	600195	#4-24 by 1-1/8" Phillip's Rd. Hd. #25 Screw
111	100514	Separator (2)				
112	310090	Separator Bolt (2)		117	300028-054	Record Locator
113	420004	Separator Spring		118	460088	Retainer Ring
114	420089	Actuator Spring				

GENERAL ELECTRIC
MODELS 860, 861, 862



MODEL 860

GENERAL ELECTRIC
MODELS 860, 861, 862

TRADE NAME	General Electric Models 860, 861, 862
MANUFACTURER	General Electric Co., Products Service, Radio Receiver Dept., 869 Broad St., Utica, N. Y.
TYPE SET	AC-DC Operated AM Receiver
TUBES (Five)	Types 12AU6 Converter, 12BA6 IF Amplifier, 12AV6 Det. -AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	105-120 Volts AC-DC
RATING	.25 Amp. @ 117 Volts AC (25 Watts)
TUNING RANGE—BROADCAST	535KC - 1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.01MFD	High side to pin 1 (grid) of 12AU6 (V1). Low side to B-.	455KC (400~ Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2		Loop	1620KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3		"	1500KC	Tune to 1500KC signal	"	A6	Adjust for maximum output while rocking tuning gang.

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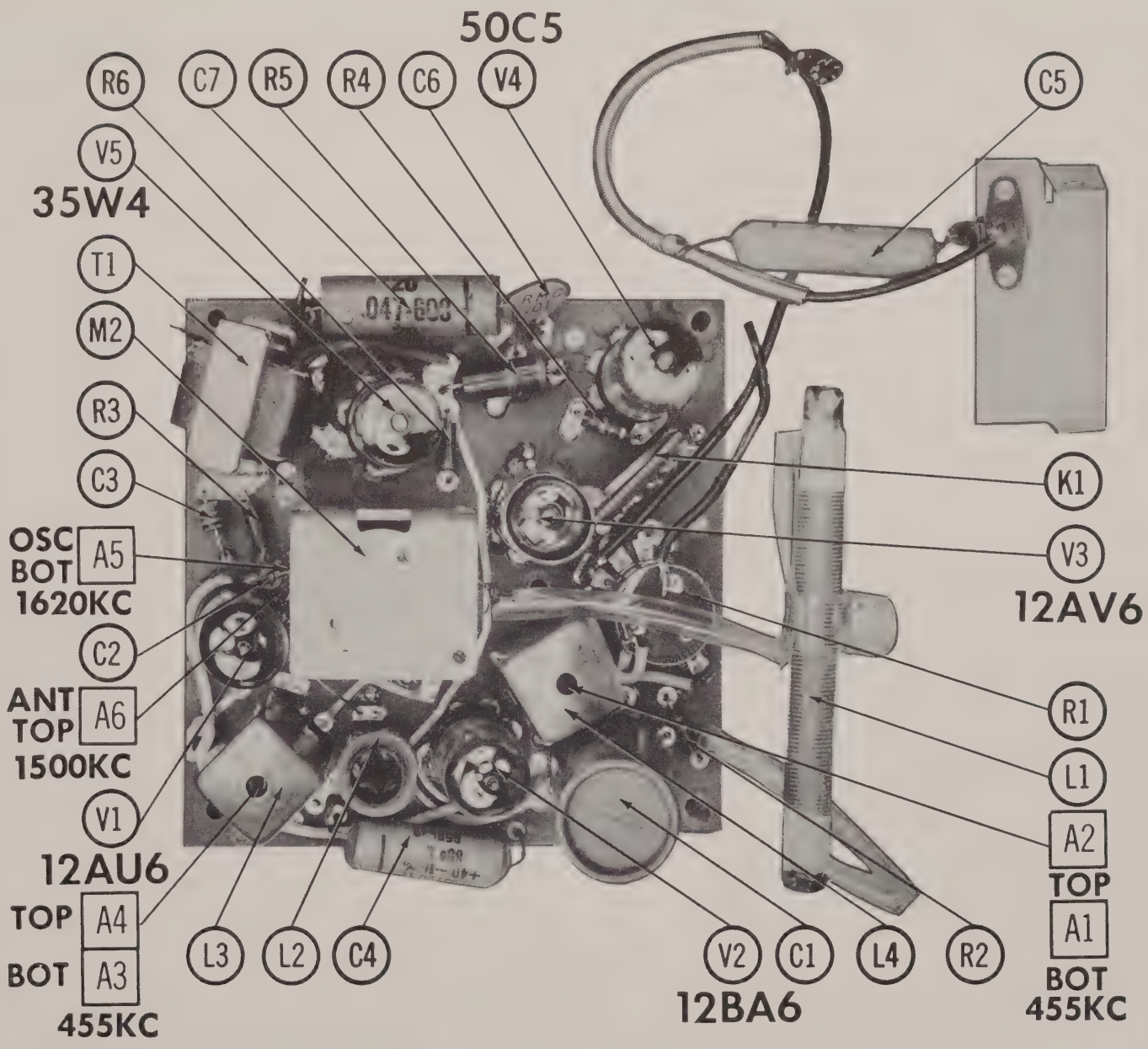


CHASSIS-TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	12AU6	
V2	IF Amplifier	12BA6	
V3	Det. - AVC - AF Amp.	12AV6	
V4	Output	50C5	
V5	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	G. E. PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	50	150	RCE-207	PRS150V5030	BBRD5315	WD210	TDLD-8	MTD-301	TVA-2450
B	30	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	G. E. PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	22			SI 22	D6-220	LT6Q22	GP-22	UC-5422	5GA-Q22	
C3	22			SI 22	D6-220	LT6Q22	GP-22	UC-5422	5GA-Q22	
C4	.05	400	RCC-078	BPD-05	DF-503	CUB4S5		GEM-415	4TM-S5	
C5	.05	400	RCC-078	BPD-05	DF-503	CUB4S5		GEM-415	4TM-S5	
C6	10000		RCW-3186					GEM-1611		10%
C7	.047	600	RCN-109	BPD-05	DF-503	CUB4S47		GEM-6147	6TM-S47	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	G. E. PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1Meg	½	RRC-385					Volume, Tap ② 500K
B	Switch							

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	G. E. PART No.	IRC PART No.	
R2	2.2Meg			BTS-2.2Meg	
R3	2.2Meg			BTS-2.2Meg	
R4	180Ω			BTS-180	
R5	1500Ω	2		BTB-1500	
R6	15Ω			BTS-15	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	G. E. PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2700Ω	3-4Ω	RT0-176	Z1101 ①	A-3025 ①	A-3332 ①	26858 ②	S-12X ①	① Use original mounting frame. ② Bend ears down.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	G. E. PART No.	QUAM PART No.	
SP1	5 1/4"	PM	3-4Ω	R0P-038	52A1SQ	

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		G. E. PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Stick	RLL-064				
L2	Osc. Coil	RLC-135				
L3	Input IF	RTL-183	16-6758	BC-352	13-PC9	
L4	Output IF	RTL-183	16-6758	BC-353	13-PC10	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	G. E. PART No.	REPLACEMENT DATA
K1	Audio Coup. Net.	5000MMF, 220MMF, 2000MMF, 400MMF, 6.8Meg, 470K, 470K	RCW-3207	

MISCELLANEOUS

ITEM No.	PART NAME	G. E. PART No.	NOTES
M1	Pilot Light		#47
M2	Tuning Cap.	RCT-101	2 Gang (Ant. 20-300MMF, Osc. 20-130MMF)

CABINETS & CABINET PARTS

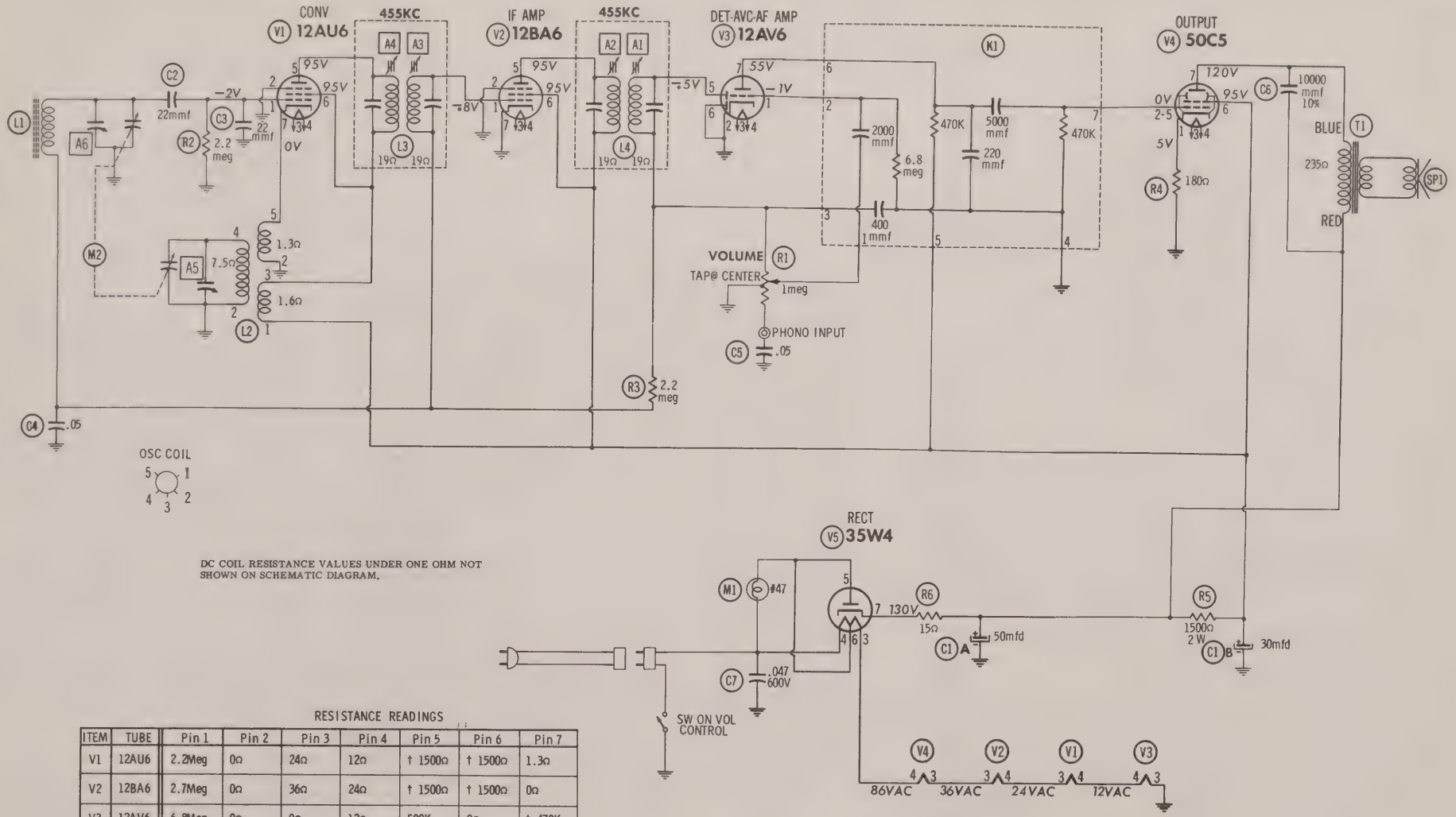
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	RDK-425	Tuning, Volume
Tuning Dial	RDK-597	
Cabinet	RAB-320	Mahogany, Model 860
Cabinet	RAB-321	Red, Model 861
Cabinet	RAB-322	Turquoise, Model 862

TUNING GANG FULLY CLOSED

DIAL CORD STRINGING

GENERAL ELECTRIC MODEL 860



DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12AU6	2.2Meg	0Ω	24Ω	12Ω	† 1500Ω	† 1500Ω	1.3Ω
V2	12BA6	2.7Meg	0Ω	36Ω	24Ω	† 1500Ω	† 1500Ω	0Ω
V3	12AV6	6.8Meg	0Ω	0Ω	12Ω	500K	0Ω	† 470K
V4	50C5	180Ω	470K	36Ω	75Ω	470K	† 1500Ω	† 250Ω
V5	35W4	NC	TP	75Ω	105Ω	100Ω	100Ω	20K(Min)

† MEASURED FROM PIN 7 OF V5
TP TIE POINT
NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to commom negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1957

H. H. SCOTT
MODEL 310B

H. H. SCOTT
MODEL 310B

TRADE NAME	H. H. Scott Model 310B		
MANUFACTURER	Hermon Hosmer Scott, Inc., 325 Putnam Ave., Cambridge 39, Mass.		
TYPE SET	AC Operated FM Tuner		
TUBES	Ten		
POWER SUPPLY	105-125Volts AC-50/60 Cycles	RATING	.36 Amp. @ 117 Volts AC (36 Watts)
TUNING RANGE—FREQ. MOD.	87MC - 109MC		

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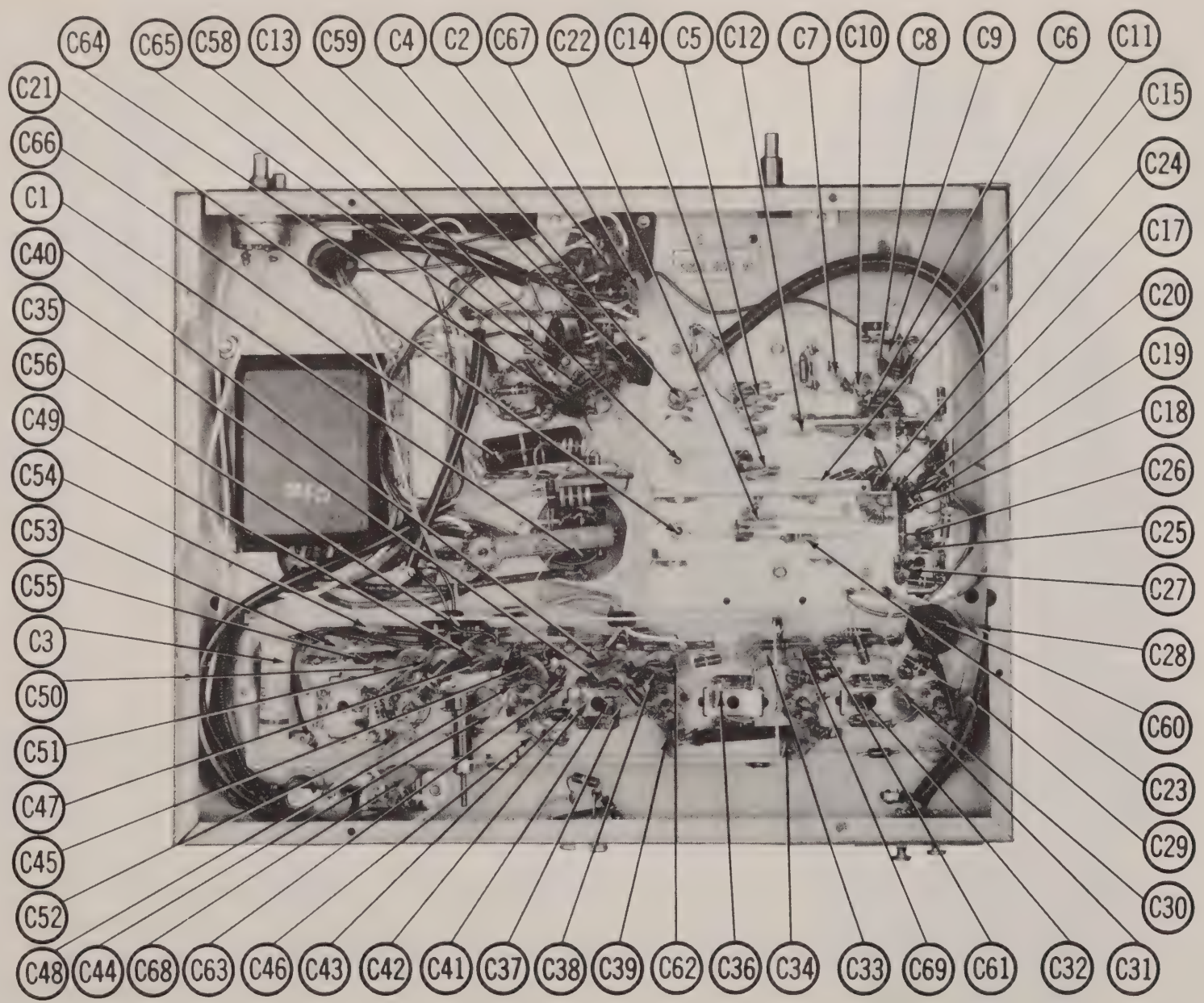
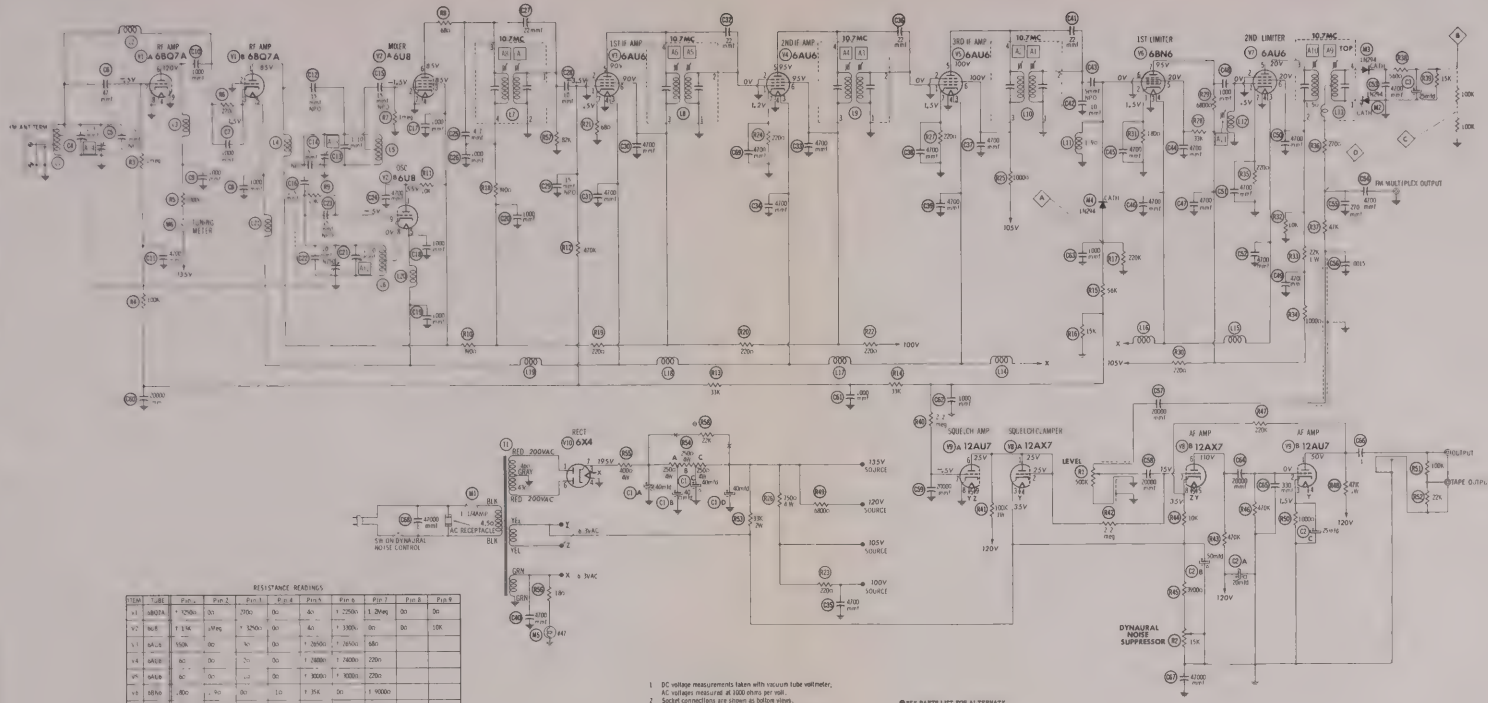


CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BQ7A	↑ 125Ω	.01	270Ω	0Ω	4Ω	↑ 225Ω	1.2Meg	0Ω	0Ω
V2	6U8	↑ 1M	.1Meg	↑ 125Ω	0Ω	4Ω	↑ 130Ω	0Ω	0Ω	10K
V3	6AU6	150K	0Ω	1Ω	0Ω	↑ 2650Ω	↑ 2650Ω	68Ω		
V4	6AU6	8Ω	0Ω	2Ω	0Ω	↑ 2680Ω	↑ 2400Ω	225Ω		
V5	6AU6	8Ω	0Ω	2Ω	0Ω	↑ 3000Ω	↑ 9000Ω	225Ω		
V6	6BN6	800Ω	0Ω	1Ω	1Ω	↑ 3K	0Ω	↑ 9000Ω		
V7	6AU6	1Ω	0Ω	2Ω	0Ω	↑ 2K	↑ 2K	225Ω		
V8	12AX7	↑ 100K	↑ 100K	▲ 1M	↑ 11K	↑ 11K	↑ 470K	↑ 2.2Meg	● 2K	↑ 11K
V9	12AU7	↑ 90K	470K	.008Ω	↑ 11K	↑ 11K	↑ 100K	2.2Meg	0Ω	↑ 11K
V10	6X4	4kΩ	NC	1Ω	0Ω	TP	430	20K(MH)		

↑ MEASURED FROM PIN 7 OF V10
● THIS READING WILL VARY, CONTROL SET FOR NORMAL OPERATION
TP THE POINT
NC NO CONNECTION

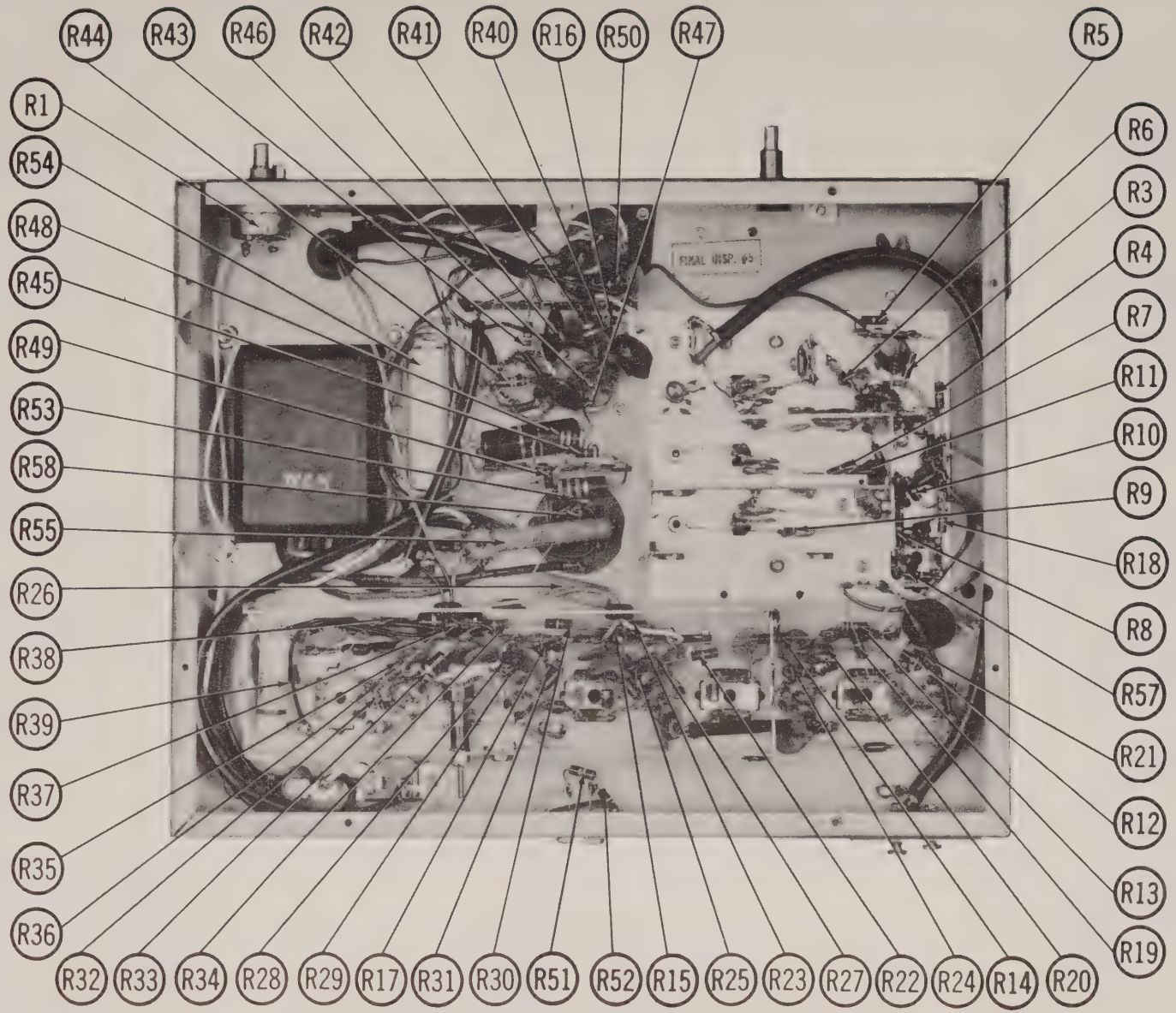
1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative
4. Line voltage maintained at 117 volts for voltage readings
5. Nominal tolerance on component values makes possible a variation of ±5% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements

●SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1957

374-6



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

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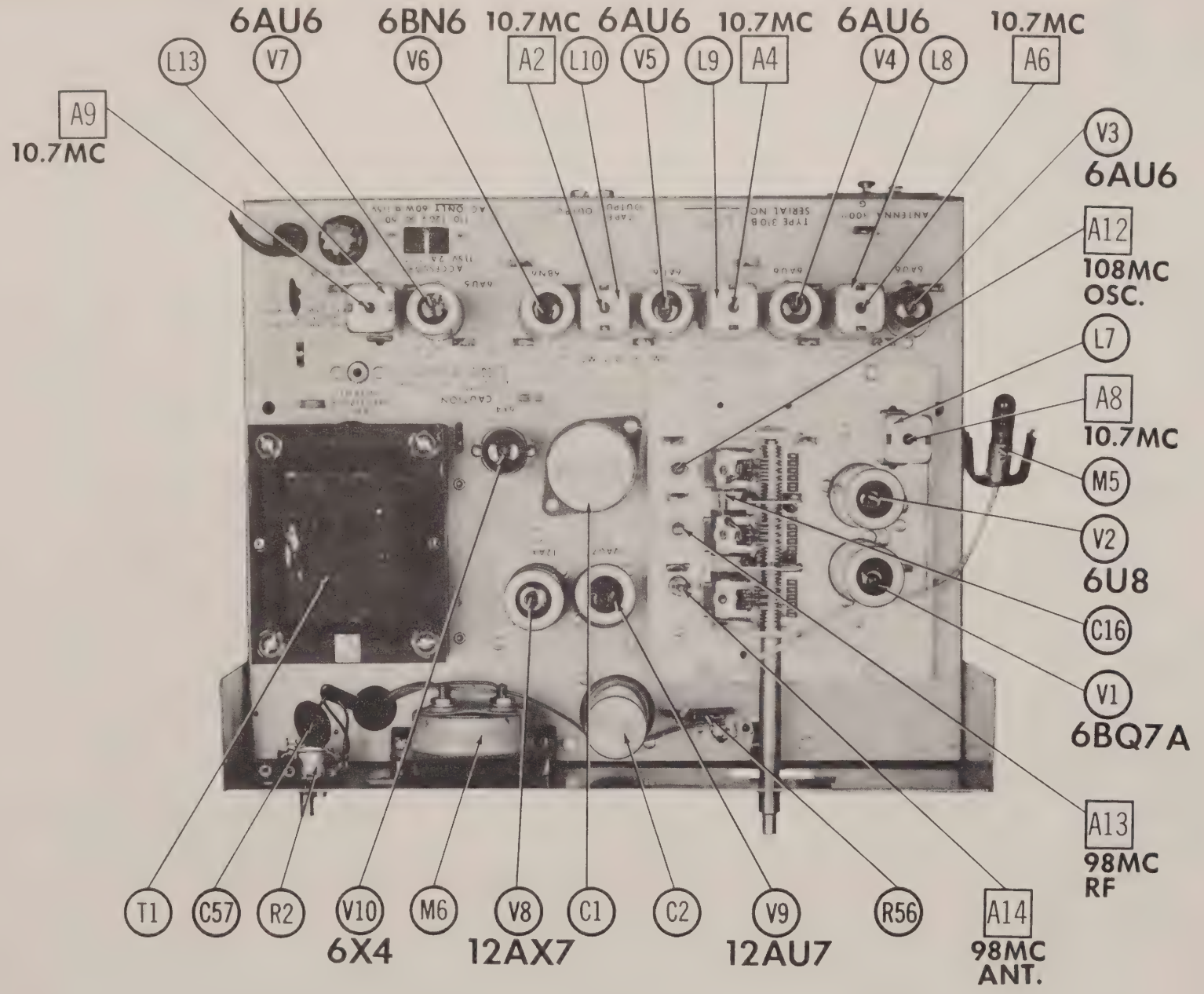
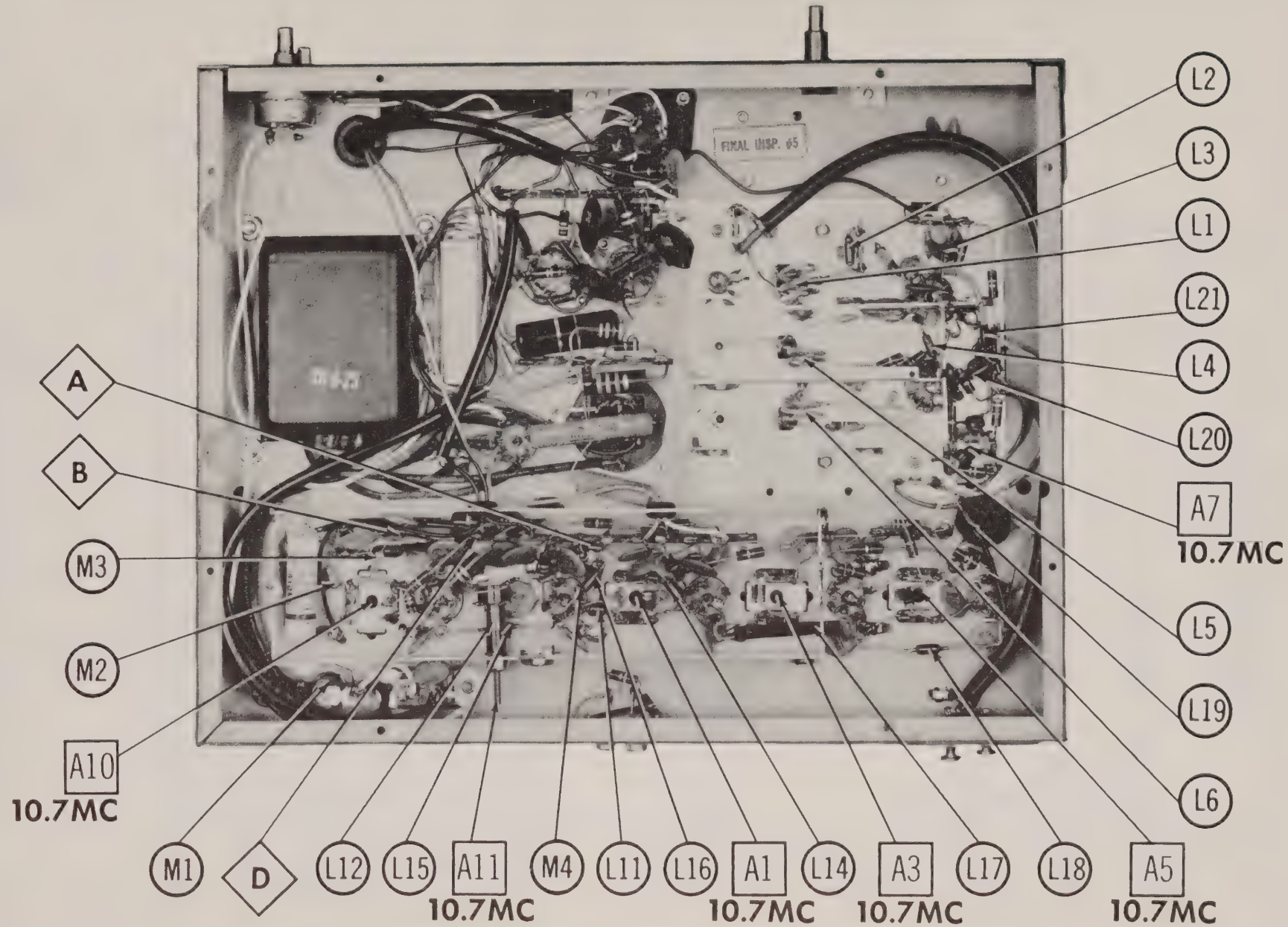


CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW - INDUCTOR & ALIGNMENT IDENTIFICATION

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.
Short pin 9 of 6U8 (V2) to chassis thru complete alignment.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	.05MFD	High side to pin 2 (grid) of 6U8 (V2). Low side to chassis.	10.7MC (Unmod)	Point of non-interference	DC probe to point Ⓐ. Common to chassis.	A1, A2, A3, A4, A5, A6, A7, A8	Adjust of maximum deflection.
2.	"	High side to pin 2 (grid) of 6BN6 (V6). Low side to chassis.	"	"	DC probe to point Ⓑ. Common to chassis.	A10, A11	"
3.	"	"	"	"	DC probe to point Ⓓ. Common to point Ⓒ.	A9	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
1.	.05MFD	High side to pin 2 (grid) of 6U8 (V2). Low side to chassis.	10.7MC (450KC Swp)	Point of Non-interference	Vert. Amp. to point Ⓐ. Low side to chassis.	A1, A2, A3, A4, A5, A6, A7, A8	Disconnect stabilizing capacitor (C3). Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
2.	"	High side to pin 2 (grid) of 6BN6 (V6). Low side to chassis.	"	"	Vert. Amp. to point Ⓑ. Low side to chassis.	A10, A11	"
3.	"	"	"	"	Vert. Amp. to point Ⓓ. Low side to chassis.	A9	Reconnect stabilizing capacitor (C3). Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A10 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	270Ω Carbon Resistor	High side to antenna terminal. Low side to chassis.	108MC (Unmod)	108MC	DC probe to point Ⓑ. Common to chassis.	A12	Adjust for maximum deflection.
5.	"	"	92MC	92MC	"	L6	Adjust for maximum deflection by compressing or expanding coil turns. Repeat steps 4 and 5 for proper tracking.
6.	"	"	98MC	98MC	"	A13, A14	Adjust for maximum deflection.

FIG. 1

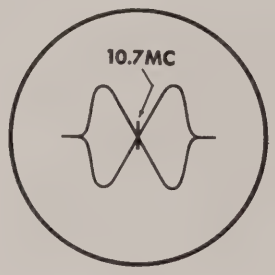


FIG. 2

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA H. H. SCOTT PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C25	4.7			NPO-SI 4.7	TCZ-4R7	C10V47C	TCO-4.7	ZT-5547	5TCCB-V47	
C26	1000			BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C27	.22									
C28	10			BPD-00001	DD-100	L10Q1	ED-10	UC-541	5GA-Q1	
C29	15			NPO-SI 15	TCZ-15	C10Q15C	TCO-15		5TCC-Q15	NPO
C30	4700			BPD-0047	DD-472	BYA10D47	ED-0047	UC-5247	5HK-D47	
C31	4700			BPD-0047	DD-472	BYA10D47	ED-0047	UC-5247	5HK-D47	
C32	.22									
C33	4700			BPD-0047	DD-472	BYA10D47	ED-0047	UC-5247	5HK-D47	
C34	4700			BPD-0047	DD-472	BYA10D47	ED-0047	UC-5247	5HK-D47	
C35	4700			BPD-0047	DD-472	BYA10D47	ED-0047	UC-5247	5HK-D47	
C36	.22									
C37	4700			BPD-0047	DD-472	BYA10D47	ED-0047	UC-5247	5HK-D47	
C38	4700			BPD-0047	DD-472	BYA10D47	ED-0047	UC-5247	5HK-D47	
C39	4700			BPD-0047	DD-472	BYA10D47	ED-0047	UC-5247	5HK-D47	
C40	4700			BPD-0047	DD-472	BYA10D47	ED-0047	UC-5247	5HK-D47	
C41	.22									
C42	10			BPD-00001	DD-100	L10Q1	ED-10	UC-541	5GA-Q1	
C43	5			NPO-SI 5	TCZ-5	C10V5C	TCO-5	ZT-555	5TCCB-V5	NPO
C44	4700			BPD-0047	DD-472	BYA10D47	ED-0047	UC-5247	5HK-D47	
C45	4700			BPD-0047	DD-472	BYA10D47	ED-0047	UC-5247	5HK-D47	
C46	4700			BPD-0047	DD-472	BYA10D47	ED-0047	UC-5247	5HK-D47	
C47	4700			BPD-0047	DD-472	BYA10D47	ED-0047	UC-5247	5HK-D47	
C48	1000			BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C49	4700			BPD-0047	DD-472	BYA10D47	ED-0047	UC-5247	5HK-D47	
C50	4700			BPD-0047	DD-472	BYA10D47	ED-0047	UC-5247	5HK-D47	
C51	4700			BPD-0047	DD-472	BYA10D47	ED-0047	UC-5247	5HK-D47	
C52	4700			BPD-0047	DD-472	BYA10D47	ED-0047	UC-5247	5HK-D47	
C53	4700			BPD-0047	DD-472	BYA10D47	ED-0047	UC-5247	5HK-D47	
C54	4700			BPD-0047	DD-472	BYA10D47	ED-0047	UC-5247	5HK-D47	
C55	270			1468-00027	D6-271	5W5T27	ED-270	UC-5327	1FM-327	
C56	.0015	400		BPD-0015	D6-152	CUB6D15	GP-1500	GEM-6215	6TM-D15	
C57	20000			BPD-02	DD-203	BYB6S2	ED-02		5HK-S2	
C58	20000			BPD-02	DD-203	BYB6S2	ED-02		5HK-S2	
C59	20000			BPD-02	DD-203	BYB6S2	ED-02		5HK-S2	
C60	20000			BPD-02	DD-203	BYB6S2	ED-02		5HK-S2	
C61	1000			BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C62	1000			BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C63	1000			BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C64	20000			BPD-02	DD-203	BYB6S2	ED-02		5HK-S2	
C65	330			1468-00033	D6-331	5W5T33	ED-330	UC-5333	1FM-333	
C66	.1	400		P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C67	4700			BPD-0047	DD-472	BYA10D47	ED-0047	UC-5247	5HK-D47	
C68	4700			BPD-0047	DD-472	BYA10D47	ED-0047	UC-5247	5HK-D47	
C69	4700			BPD-0047	DD-472	BYA10D47	ED-0047	UC-5247	5HK-D47	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA H. H. SCOTT PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	½	RCV-500K-3	B-60	A47-500K-Z	Q13-133	U48	Level
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
R2A	15K	½	RCV-15K-35W	B-20	A47-15K-S	Q11-119	U26	Dynaural Noise Supp.
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
C	Switch			KB-1	SWE-12	76-1	US-26	

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA H. H. SCOTT PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Ant. Coil					
L2	RF Choke		19-1000	BC-561	4602	1.2 Microhenries
L3	RF Choke				4586	.33 Microhenries
L4	RF Choke		19-1000	BC-561	4602	1 Microhenry
L5	RF Coil					
L6	Osc. Coil					
L7	1st IF		16-3487	FM-254	1463	
L8	2nd IF		16-3487	FM-254	1463	
L9	3rd IF		16-3487	FM-254	1463	
L10	4th IF		16-3487	FM-254	1463	
L11	Limiter Grid Coil		19-3075	TV-186	6172	80 Microhenries
L12	Limiter Grid Coil					
L13	Ratio Det.		17-3498	FM-255	1465	
L14	Fil. Choke		19-1000	BC-561	4602	1 Microhenry
L15	Fil. Choke		19-1000	BC-561	4602	1 Microhenry
L16	Fil. Choke		19-1000	BC-561	4602	1 Microhenry
L17	Fil. Choke		19-1000	BC-561	4602	1 Microhenry
L18	Fil. Choke		19-1000	BC-561	4602	1 Microhenry
L19	Fil. Choke		19-1000	BC-561	4602	1 Microhenry
L20	Fil. Choke		19-1000	BC-561	4602	1 Microhenry
L21	Fil. Choke		19-1000	BC-561	4602	1 Microhenry

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA H. H. SCOTT PART No. FUSE	H. H. SCOTT PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG	1 1/4A (125V) S/B			3131.25 (3AG-1 1/4 S/B)	342003	MDL	HCM

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA H. H. SCOTT PART No.	CBS PART No.	SYLVANIA PART No.	NOTES
M2	1N294		1N54A	1N34A	Ratio Det. (Pigtail)
M3	1N294		1N54A	1N34A	Ratio Det. (Pigtail)
M4	1N294		1N54A	1N34A	AVC Rectifier (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	H. H. SCOTT PART No.	NOTES
M5	Dial Light		#47
M6	Meter		Tuning

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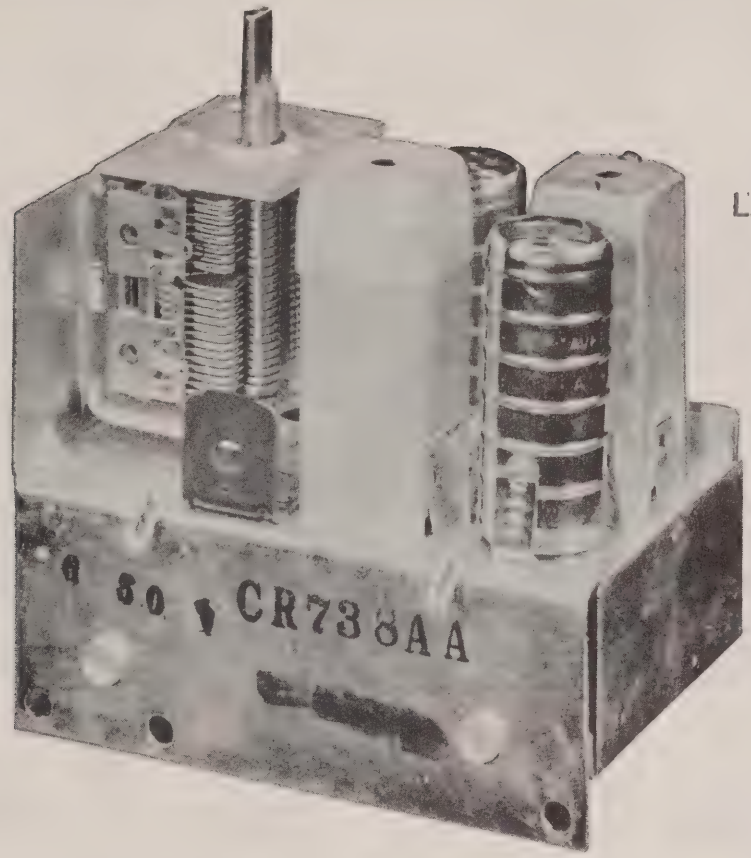

MAGNAVOX
CHASSIS CR-738

MAGNAVOX
CHASSIS CR-738

TRADE NAME	Magnavox Chassis CR-738
MANUFACTURER	Magnavox Co., 2131 Bueter Rd., Fort Wayne 4, Indiana
TYPE SET	Externally Powered AM Tuner
TUBES (Two)	Types 12BE6 Converter, 12BA6 IF Amplifier
POWER SUPPLY	Externally Powered
TUNING RANGE—BROADCAST	540KC - 1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in the same relative position to chassis as when the receiver is in cabinet.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1	.01MFD	High side to pin 7 (grid) of 12BE6 (V1). Low side to chassis.	455KC (400~ Mod)	Quiet point near mid-range	Across C1	A1, A2 A3, A4	Adjust for maximum output.
2	"	"	1620KC	Tuning gang fully open	"	A5	"
3		Loop	1400KC	Tune to 1400KC signal	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
4		"	600KC	600KC	"	A7	If necessary, adjust movable part of rod antenna for maximum output. Repeat steps 3 & 4.

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PARTS LIST AND DESCRIPTIONS

MAGNAVOX
CHASSIS CR-738

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	12BE6	

ITEM No.	USE	TYPE	NOTES
V2	IF Amplifier	12BA6	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	MAGNAVOX PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1	50000		250258-1	BPD-05	DF-503				5HK-S5	
C2	47		250218-17	BPD-000047	DD-470	L10Q47	ED-47	UC-5447	5GA-Q47	
C3	5000		250175-1	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C4	.1	200	250202-13	P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	
C5	2000		250218-20	BPD-002	DD-202	BYA10D2	ED-002	DC522	5HK-D2	
C6	5000		250175-1	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C7	10000		250218-19	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

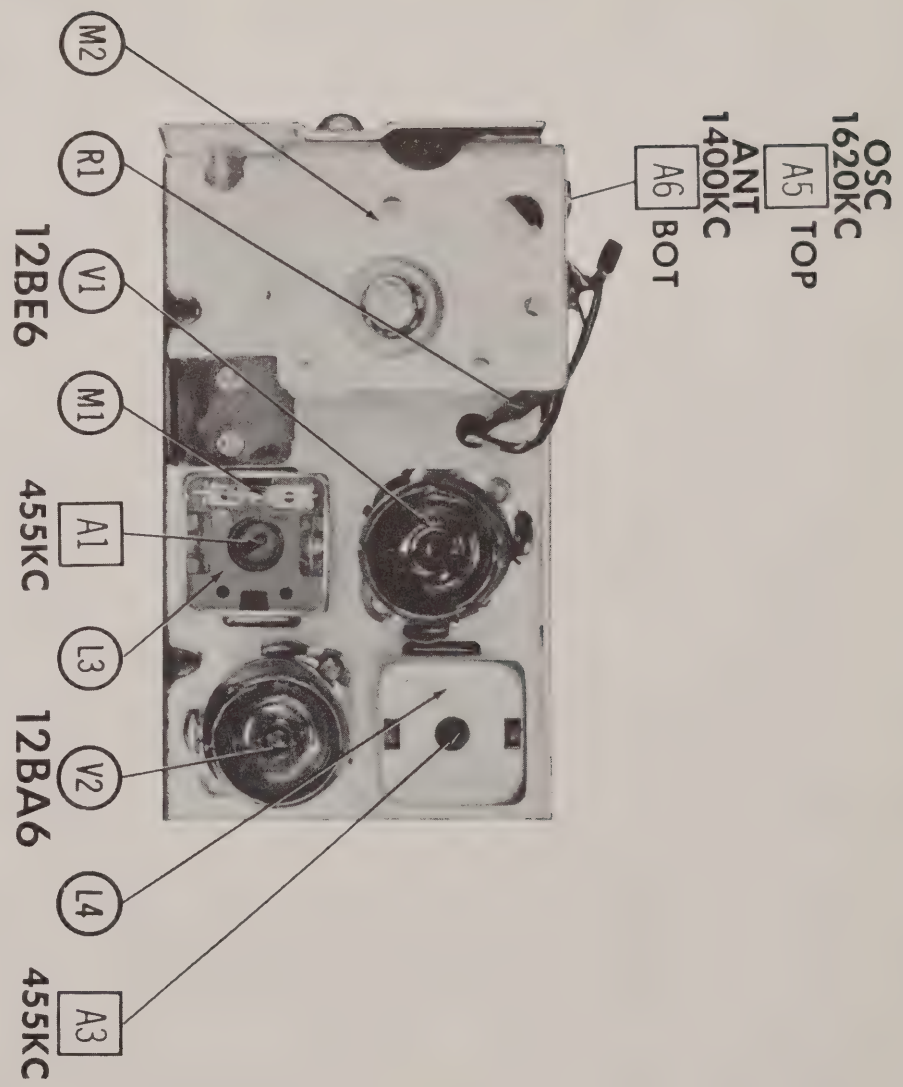
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MAGNAVOX PART No.	IRC PART No.	
R1	100Ω		230104-50	BTS-100	
R2	1000Ω		230104-62	BTS-1000	
R3	1000Ω		230104-62	BTS-1000	
R4	22K		230104-78	BTS-22K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MAGNAVOX PART No.	IRC PART No.	
R5	120Ω		230104-51	BTS-120	
R6	3.3Meg		230104-104	BTS-3.3Meg	
R7	220K		230104-90	BTS-220K	
R8	47K		230104-82	BTS-47K	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		MAGNAVOX PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Stick	360705-1				
L2	Osc. Coil	360702-1				
L3	Input IF	360611-1	16-6758	BC-352	12-C1	
L4	Output IF	360703-1				

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	MAGNAVOX PART No.	REPLACEMENT DATA
K1	Diode RF Filter	100MMF, 100MMF, 47K	250170-1	Aerovox PA-97-1 Centralab PC-50 Cornell-Dubilier 111TM1 Erie 1403-01 Sprague D-1

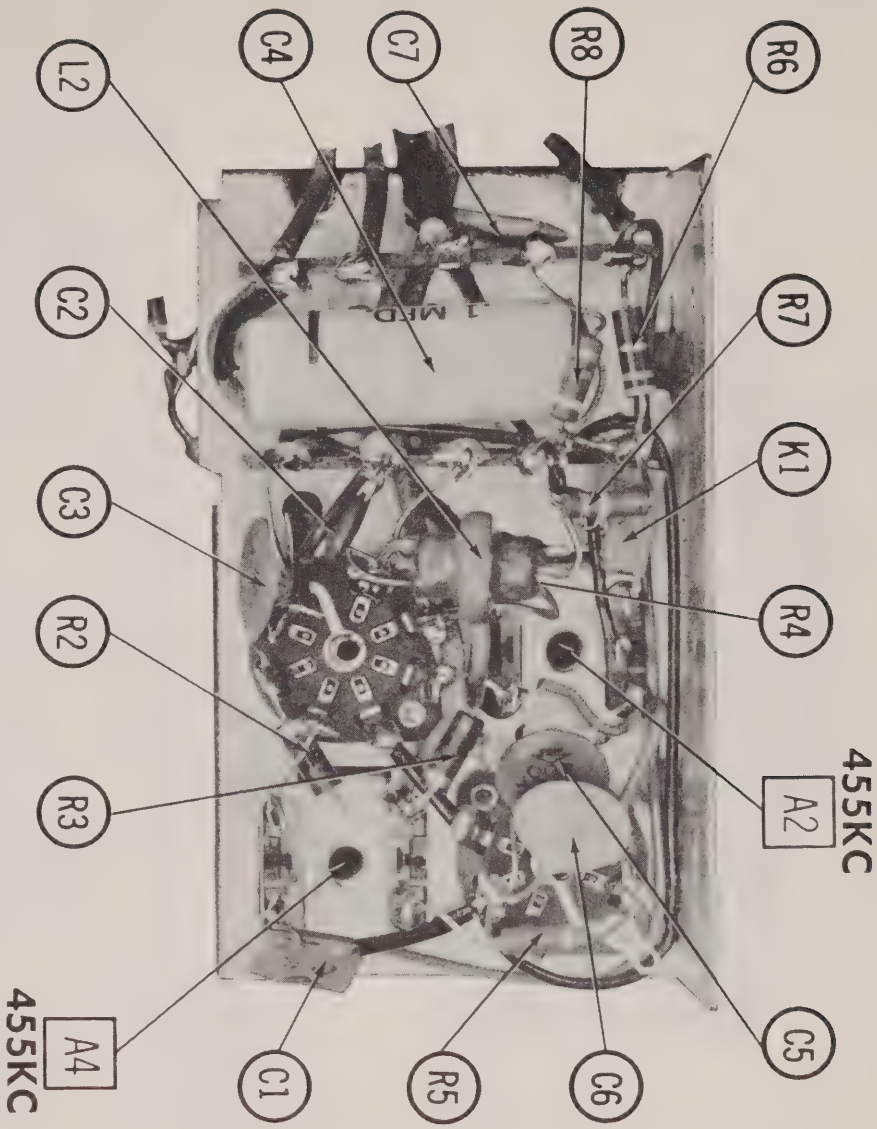
CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		MAGNAVOX PART No.	CBS PART No.	SYLVANIA PART No.	
M1	1N34A	530049-1	1N34A	1N34A	Audio Det. (Clip in)

MISCELLANEOUS

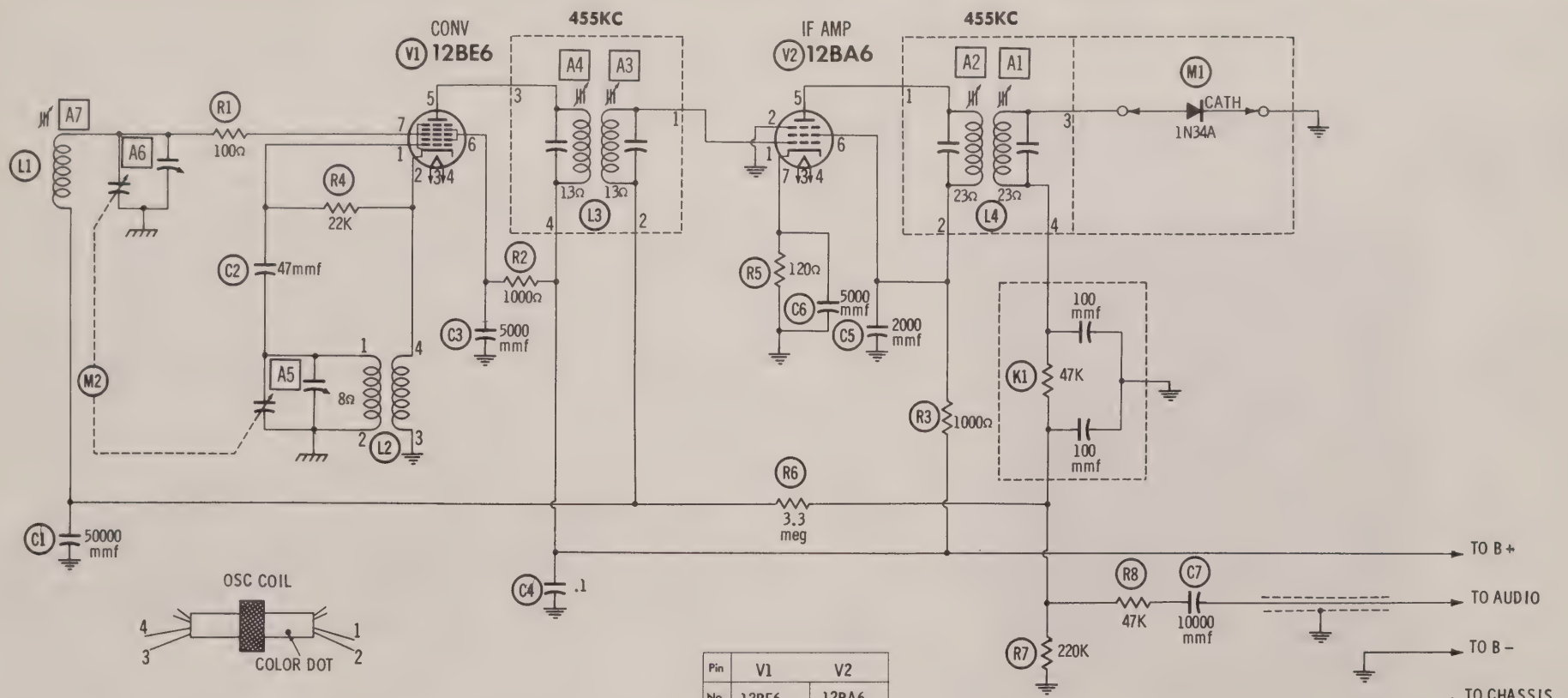
ITEM No.	PART NAME	MAGNAVOX PART No.	NOTES
M2	Tuning Cap.	260140-1	2 Gang (Ant. 35-395MMF, Osc. 15-100MMF)

CHASSIS—BOTTOM VIEW



MAGNAVOX CHASSIS CR-738

MAGNAVOX CHASSIS CR-738



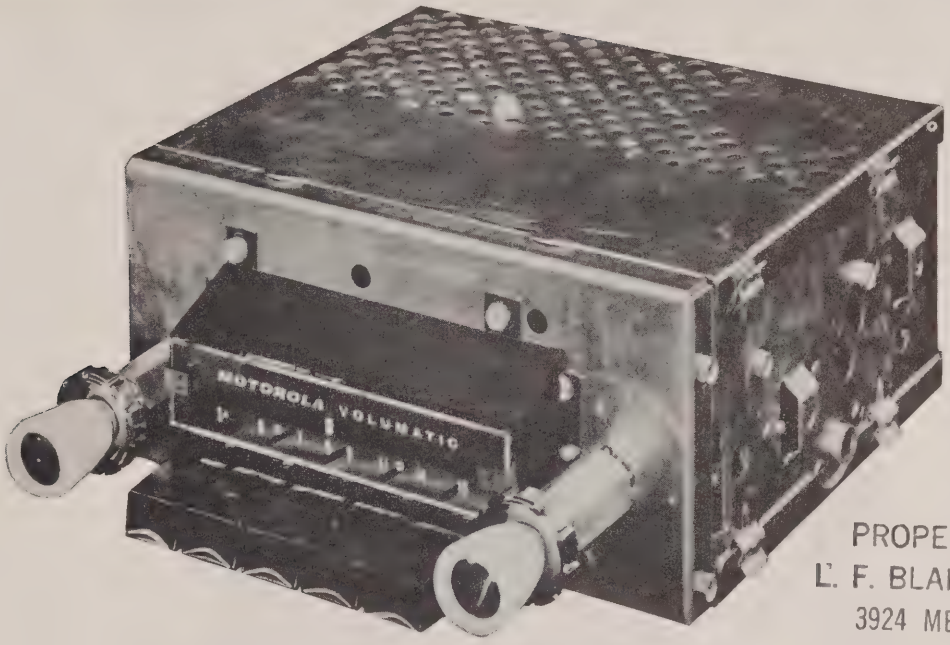
Pin No.	V1 12BE6	V2 12BA6
1	22K	3.3Meg
2	.7Ω	0Ω
3	0Ω	12Ω
4	12Ω	24Ω
5	† 13Ω	† 1000Ω
6	† 1000Ω	† 1000Ω
7	3.3Meg	120Ω

† MEASURED FROM JUNCTION OF C4 & R2
FILAMENT MEASURED FROM BROWN LEAD

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1957

MOTOROLA
MODEL VWA7



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3924 MEADE St.
DENVER, COLORADO

MOTOROLA
MODEL VWA7

TRADE NAME	Motorola Model VWA7 (For 1953, 1954, 1955, 1956, 1957 Volkswagen Automobiles)
MANUFACTURER	Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Illinois
TYPE SET	Battery Operated Custom Built AM Automobile Receiver
TUBES (Five)	Types 6BE6 Converter, 6BA6 IF Amplifier, 6CR6 Det.-AVC-AF Amp., 6AQ5 Output, 6X4 Rectifier
POWER SUPPLY	6 Volt Storage Battery — RATING 5.6 Amp. @ 6.3 Volts DC
TUNING RANGE—BROADCAST	535-1605KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side thru dummy to antenna receptacle. Low side to chassis.	262.5KC (400~ Mod.)	High frequency end stop.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	Fig. 1	Thru dummy to antenna receptacle.	1610KC	"	"	A5, A6, A7	"
3.	With radio installed in car and antenna fully extended, tune in a weak station near 1400KC. Adjust A7 for maximum volume.						
	The following steps are not necessary unless tuner or tuning cores have been tampered with or components have been replaced. Remove escutcheon, dial scale assembly and dial scale background to expose tuner adjustment. Back tuning cores out of coils but not out of coil forms. Proceed with step 4.						
4.	Fig. 1	Thru dummy to antenna receptacle.	1610KC	High frequency end stop.	Across voice coil.	A5, A6, A7	Adjust for maximum output.
5.	"	"	1200KC	Adjust tuner 9/32" from high frequency end stop.	"	A8, A9, A10	Adjust for maximum output. Repeat step 4 & 5 making step 4 the last adjustment.

DIAL POINTER ADJUSTMENT

Pull pushbutton out. Tune manually to desired station. Press pushbutton in firmly. Repeat procedure on remaining pushbuttons.

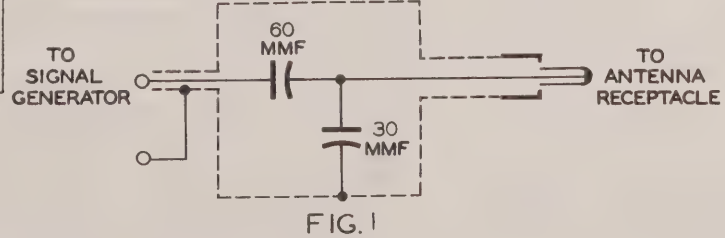

FIG. 1

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PARTS LIST AND DESCRIPTIONS

MOTOROLA
MODEL VWA7

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	6BE6	
V2	IF Amplifier	6BA6	
V3	Det. -AVC-AF Amplifier	6CR6	

ITEM No.	USE	TYPE	NOTES
V4	Output	6AQ5	
V5	Rectifier	6X4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■15	350	23A485677	AFH3-104	CO770	FP328	TMT-89	T-455	
B	▲10	350							
C	20	25							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	35-200		20K541699							
C3	.002	600	8R121568	BPD-002	DD-202	CUB6D2	GP-2000	GEM-622	6TM-D2	
C4	20-120		20K542018							
C5	27		21R410089		TCZ-27	C10Q27C	TCO-27			10% NPO
C6	47		21R115593	N750-SI47	TCN-47	C10Q47U	TC7-47	NT-5447	5TCU-Q47	N750
C7	100		21R410036	N750-SI100	TCN-100	C10T1U	TC7-100	NT-531	5TCU-T1	10% N750
C8	310-390		20K543092							
C9	.05	200	8R121005	BPD-05	DF-503	CUB2S5		GEM-415	2TM-S5	
C10	.05	400	8R121567	BPD-05	DF-503	CUB4S5		GEM-415	4TM-S5	
C11	.01	200	8R121868	SI-10000	D6-103	CUB4S1	GP-10000	GEM-411	4TM-S1	
C12	.05	400	8R121567	BPD-05	DF-503	CUB4S5		GEM-415	4TM-S5	
C13	.002	600	8R121568	BPD-002	DD-202	CUB6D2	GP-2000	GEM-622	6TM-D2	
C14	10000		21R121946	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C15	.01	200	8R121868	SI10000	D6-103	CUB4S1	GP-10000	GEM-411	4TM-S1	
C16	470		21R114554	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47	
C17	.004	600	8R121000	BPD-004	DD-402	CUB6D4	GP-4000	GEM-624	6TM-D4	
C18	.5	100	8K122076	P288N-5		CUB2P5		GEM-205	68P20	
C19	.02	1000	8R121004			CUB10S2		GEM-1012	10TM-S2	
C20	.5	100	8K122076	P288N-5		CUB2P5		GEM-205	68P20	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K	1/2	18B542013	F1-41	RTV-639C		UE1499S	Tone
B	2Meg			R2-72	Not Req.		Not Req.	Volume, Tap ⓐ 1 Meg.
C	Switch			KB-1	Not Req.		Not Req.	

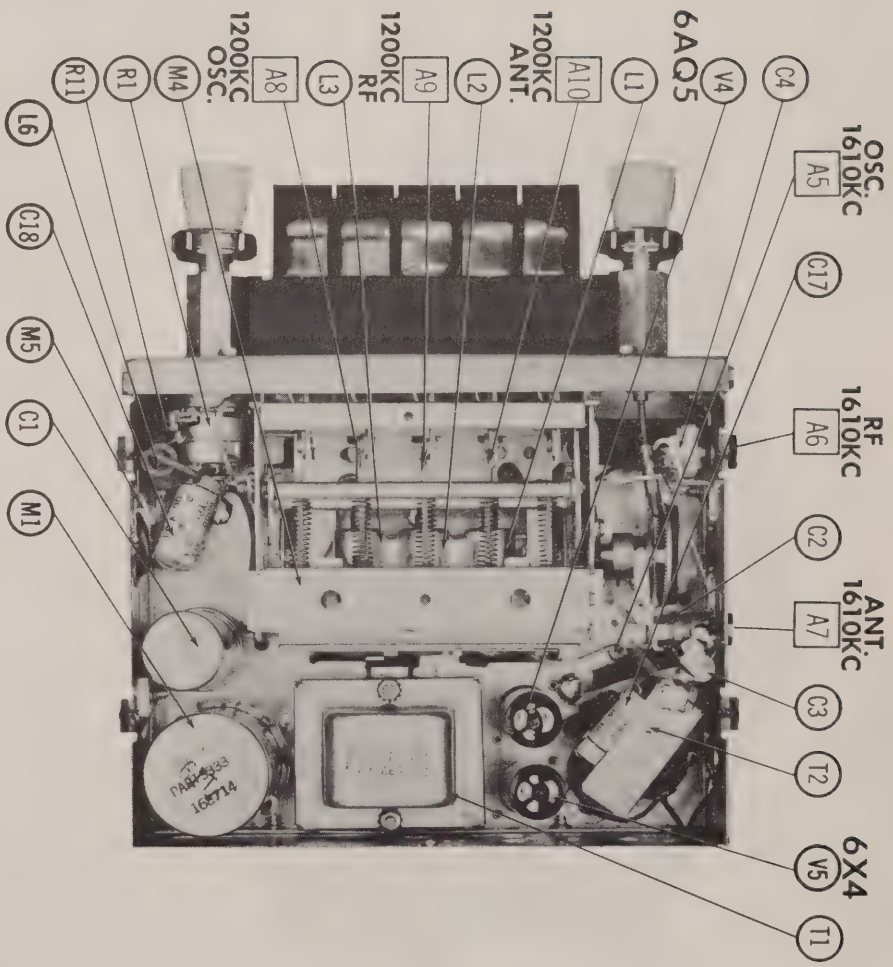
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MOTOROLA PART No.	IRC PART No.	
R2	1Meg		6R6004	BTS-1Meg	
R3	22K		6R6028	BTS-22K	
R4	6800Ω	2	6R5690	BTB-6800	
R5	33Ω		6R2036	BTS-33	
R6	3.3Meg		6R2118	BTS-3.3Meg	
R7	22K		6R6028	BTS-22K	
R8	3.3Meg		6R2118	BTS-3.3Meg	
R9	220K		6R6015	BTS-220K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MOTOROLA PART No.	IRC PART No.	
R10	1Meg		6R6004	BTS-1Meg	
R11	330K		6R6014	BTS-330K	
R12	470K		6R6032	BTS-470K	
R13	220Ω		6R6270	BTS-220	
R14	2200Ω	2	6R476130	BTB-2200	
R15	56Ω	1	6R2037	BTA-56	
R16	56Ω	1	6R2037	BTA-56	
R17	150Ω	1	6R6330	BTA-150	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (VIBRATOR)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	6.3VCT @ 3.5A	440VCT @ .040A			25C537164					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	5200Ω	3-4Ω	25B70171	Z1107	A-2930	A-3877	24S51	S-3X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	QUAM PART No.	
SP1	6" x 9"	PM	3-4Ω	50C541101	69A2	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		MOTOROLA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	24C535458				Part of Tuner M4
L2	RF Coil	24C535458				Part of Tuner M4
L3	Osc. Coil	24C535456				Part of Tuner M4
L4	Input IF	24B580193	16-6752	BC-350	12-H2	
L5	Output IF	24K591267	16-6754	BC-354	12-H6	
L6	"A" Lead Choke	24K542019				1.7 Microhenry
L7	Hash Choke	24A538914				10.3 Microhenries

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA				NOTES
				MOTOROLA PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M1	Interrupter	6.3V	115v	48B3333	5342	903M	5342	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			MOTOROLA PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	SFE9	9A	65R16248	9K541991	307009. (SFE9)	155009	SFE9	HRH

MISCELLANEOUS

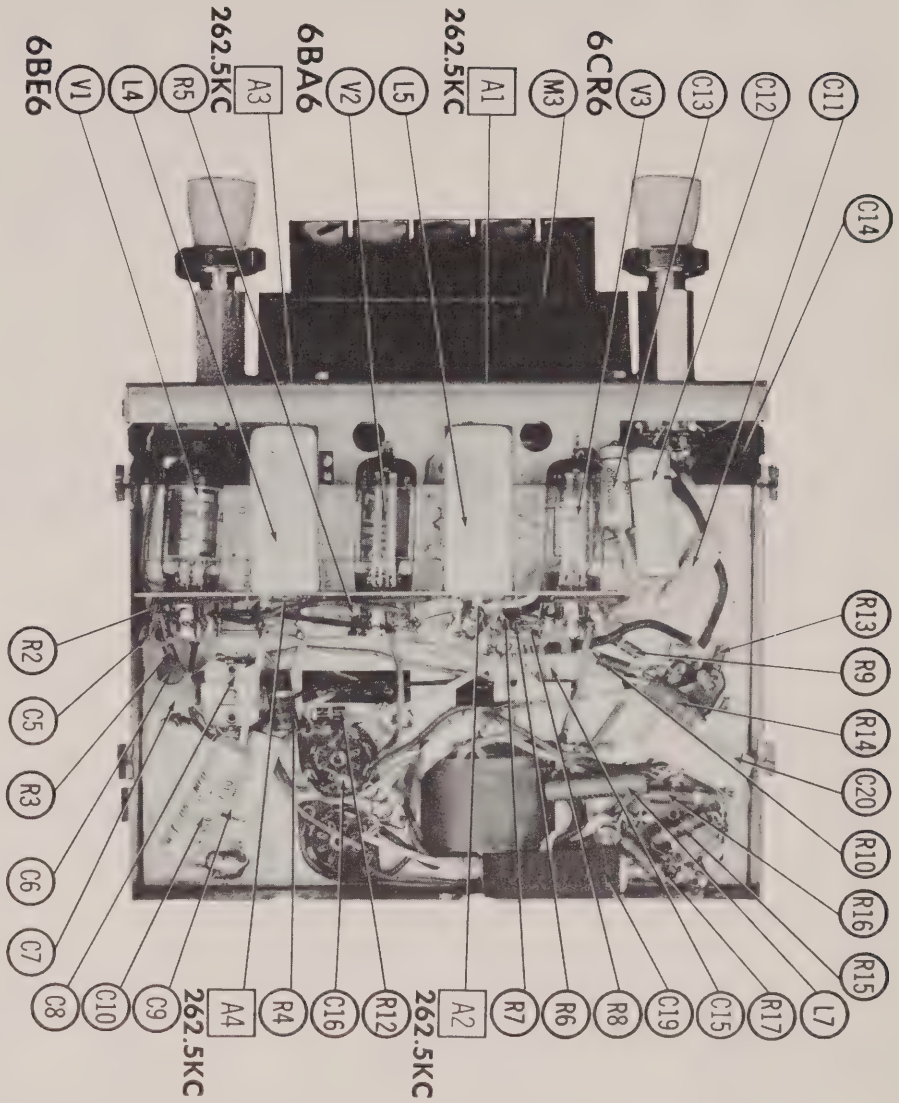
ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M3	Dial Light	65R10867	#44
M4	Tuner	77K542165	(AT 233) - Complete
M5	Spark Plate	64K530177	

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	36K542194	On-Off-Vol., Tuning
Knob	36B522020	Tone
Knob	36K542005	Dummy
Cover	15K541823	Bottom
Cover	15C541670	Top
Dial	34B542050	
Pointer	1V542214	

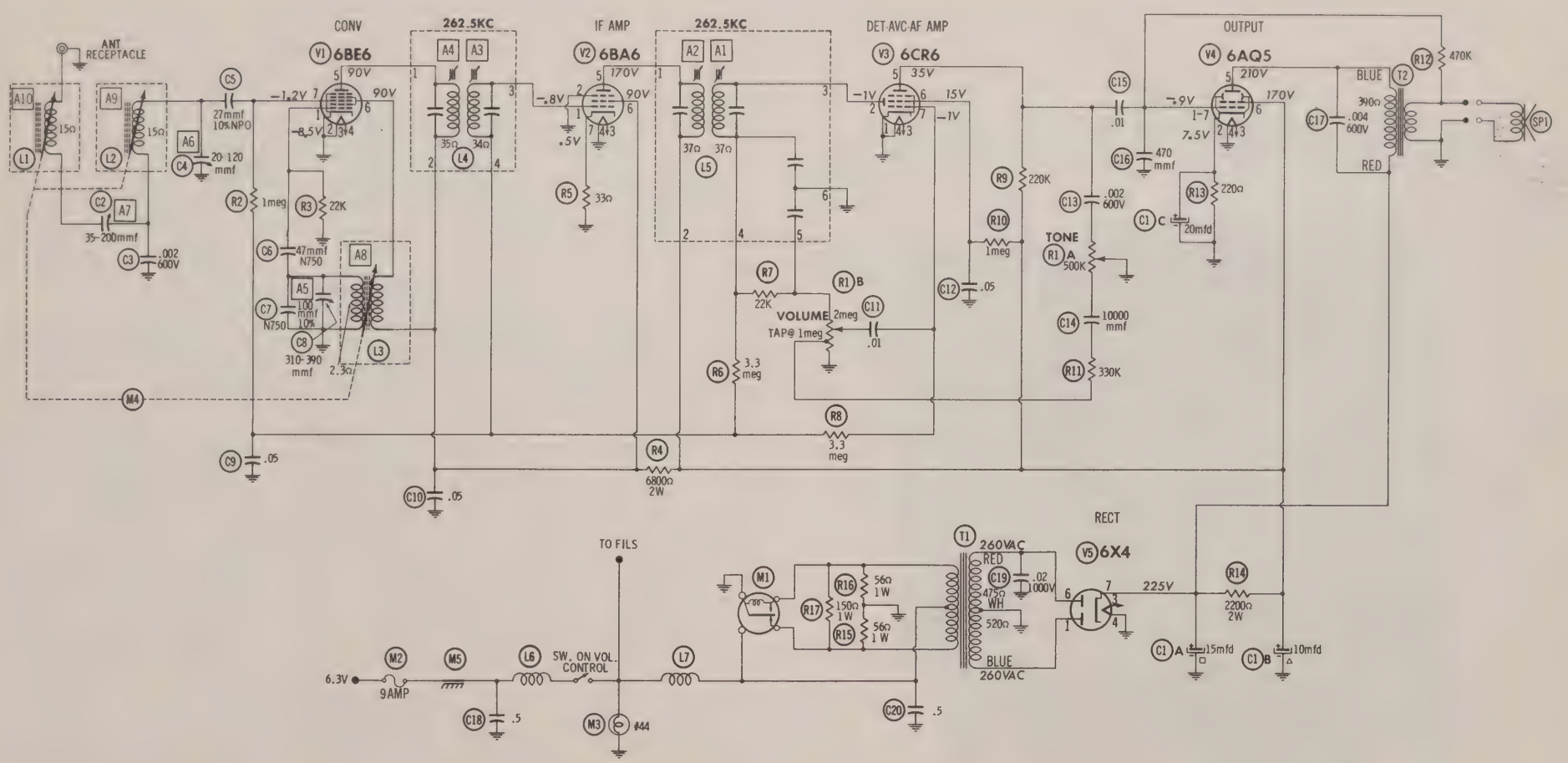
CHASSIS—BOTTOM VIEW



SET 374 FOLDER 8

MOTOROLA MODEL VWA7

MOTOROLA MODEL VWA7



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 6.3 volts for voltage readings.
5. Nominal tolerance on component values makes posssible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	6BE6	22K	0Ω	0Ω	.4Ω	†9000Ω	†9000Ω	6.3Meg
V2	6BA6	5.3Meg	0Ω	.4Ω	0Ω	†2200Ω	†9000Ω	33Ω
V3	6CR6	0Ω	2Meg	.4Ω	0Ω	†220K	†1Meg	8.6Meg
V4	6AQ5	470K	220Ω	.4Ω	0Ω	†390Ω	†2200Ω	470K
V5	6X4	520Ω	NC	.4Ω	0Ω	NC	475Ω	20K(MIN)

† MEASURED FROM PIN 7 OF V5.
NC NO CONNECTION.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

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MODEL E6608TN (Ch. 7L71)

PHILCO MODELS E4208S, E4605, C, T, E4607, L, T, E6606, E6608TN, E6610L, M, UE4208S, UE4605, C, T, UE4607, L, T, UE6606, UE6608TN, UE6610L, M (Ch. 7L70, U, 7L71, U)

TRADE NAME	Philco	MODELS	CHASSIS
		E4208S, E4605, C, T, E4607, L, E6606	7L70
		UE4208S, UE4605, C, T, UE4607, L, UE6606	7L70U
		E4607T, E6608TN, E6610L, M	7L71
		UE4607T, E6608TN, UE6610L, M	7L71U
MANUFACTURER	Philco Corp., Tioga & "C" Streets, Philadelphia, Pa.		
TYPE SET	Television Receiver		
TUBES	Nineteen		
POWER SUPPLY	110-120 Volts AC, 60 Cycle	RATING 200 Watts, 1.7 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

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Tube Placement Chart 3

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*TRADE MARK

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DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove the channel selector and volume push-on type control knobs.
2. Remove 2 metal screws and the escutcheon.
3. Remove 4 push-on type control knobs.
4. Remove 14 wood screws and the rear cover.
5. Remove speaker leads from the audio output transformer.
6. Remove the picture tube socket, yoke plug, remote control plug and HV lead.
7. Remove the "Range" knob from the rear of the cabinet.
8. Remove 2 wood screws from the upper left chassis bracket.
9. Remove 3 chassis bolts from the bottom.
10. Remove the chassis.
11. Remove 2 wood screws and the remote control socket.
12. Depress 2 spring clips holding the on-off switch and top-touch tuning switch, swing down and to the left to remove.
13. Remove 4 speaker nuts and 2 speakers.

MODEL E6608TN (Ch. 7L71)

MODELS	CHASSIS
E4208S, E4605, C, T, E4607, L, E6606	7L70
UE4208S, UE4605, C, T, UE4607, L, UE6606	7L70U
E4607T, E6608TN, E6610L, M	7L71
UE4607T, UE6608TN, UE6610L, M	7L71U

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

For touch-up adjustment of the VHF oscillator it is necessary to remove the chassis from the cabinet. (See disassembly instructions).

PICTURE TUBE SAFETY GLASS CLEANING

For picture tube and safety glass cleaning, it is necessary to remove the chassis. (See disassembly instructions).

FOCUS

The focus may be varied by means of a screw in the focus magnet assembly. Use a non-ferrous screwdriver to adjust the focus.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Set the horizontal hold control to the center of its range and adjust the auxiliary horizontal hold control until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the ratio detector secondary (A9) located on top of chassis.

FUSES

One fuse is used for LV power supply protection. (For location see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

PHILCO MODELS E4208S, E4605, C, T, E4607, L, T, E6606, E6608TN, E6610L, M, UE4208S, UE4605, C, T, UE4607, L, T, UE6606, UE6608TN, UE6610L, M (Ch. 7L70, U, 7L71, U)

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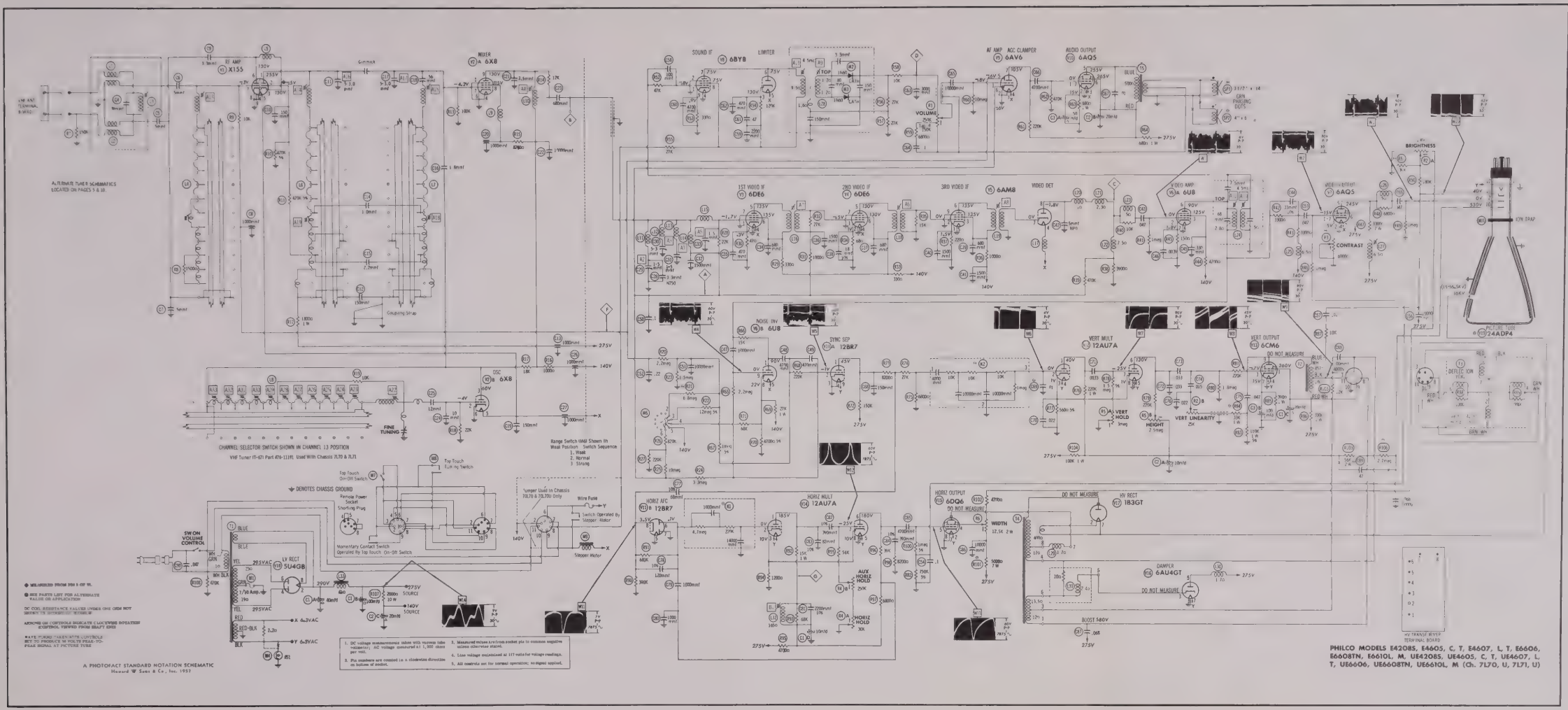
H130

DATE 10-57 SET 374 FOLDER 9


RF AMP X155
MIXER V7A 6X8
SOUND IF V8 6BY8
LIMITER
AF AMP ACC CLAMPER V9 6AV6
AUDIO OUTPUT V10 6AQ5
1ST VIDEO IF V3 6DE6
2ND VIDEO IF V4 6DE6
3RD VIDEO IF V5 6AM8
VIDEO DET
VIDEO AMP V6A 6U8
VIDEO OUTPUT V7 6AQ5
NOISE INV V6B 6U8
SYNC SEP V11A 12BR7
VERT MULT 12AU7A
VERT OUTPUT V11B 6CM6
OSC V8 6X8
HORIZ AFC V11B 12BR7
HORIZ MULT V14 12AU7A
HORIZ OUTPUT V13 6DQ6
HV RECT V17 1B3GT
DAMPER V16 6AU4GT
LV RECT V18 5U4GB
PICTURE TUBE V19 24ADP4
ION TRAP
DEFLECTION YOKE
BRIGHTNESS
CONTRAST
VERT HOLD
HEIGHT
VERT LINEARITY
HORIZ HOLD
AUX HORIZ HOLD
WIDTH
BOOST 580V
VOLUME
FINE TUNING
CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION
VHF Tuner (T-67) Part 476-1149. Used With Chassis 7L70 & 7L71
Range Switch (VHF Shown In Weak Position. Switch Sequence 1. Weak 2. Normal 3. Strong
Top Touch Tuning Switch
Top Touch On-Off Switch
Remote Power Socket Shorting Plug
Momentary Contact Switch Operated By Top Touch On-Off Switch
Jumper Used In Chassis 7L70 & 7L70U Only
Wire Fuse
Switch Operated By Stepper Motor
Stepper Motor
SW ON VOLUME CONTROL
DENOTES CHASSIS GROUND
ALTERNATE TUNER SCHEMATICS LOCATED ON PAGES 5 & 10.
Coupling Strap
295VAC
290V
275V SOURCE
140V SOURCE
6.3VAC
1. DC voltage measurements taken with vacuum tube voltmeter; AC voltage measured at 1,000 ohms per volt.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; no signal applied.
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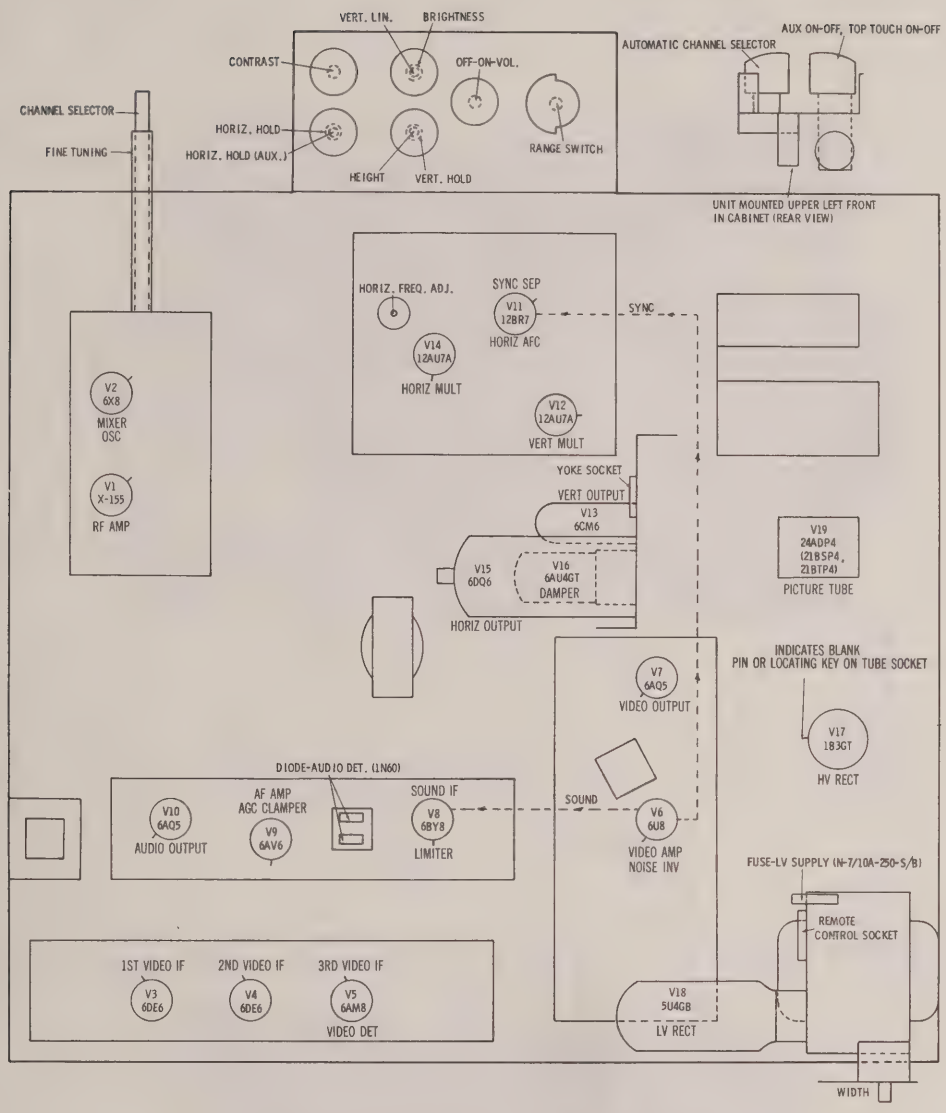
TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - **Fuse (M1), V18**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V3, V4, V5, V6**
No pic, no sound, has snow - **V1, V2, V3**
No pic, has sound, has raster - **V6, V7, V19**
Has pic, no sound - **V8, Diode (M2, M3), V9, V10**
Overloaded picture - **V9**

SYNC FAILURE
No vert. sync - **V6, V11**
No horiz. sync - **V6, V11**
No vert. or horiz. sync - **V6, V11**

SWEEP FAILURE
No raster, has sound - **V11, V14, V15, V16, V17, V19**
No vertical deflection - **V12, V13**
Poor vert. linearity or foldover - **V12, V13**
Poor horiz. linearity or foldover - **V14, V15, V16**
Narrow picture - **V14, V15, V16, V18**
Vert. off freq. - **V12**
Horiz. off freq. - **V14**

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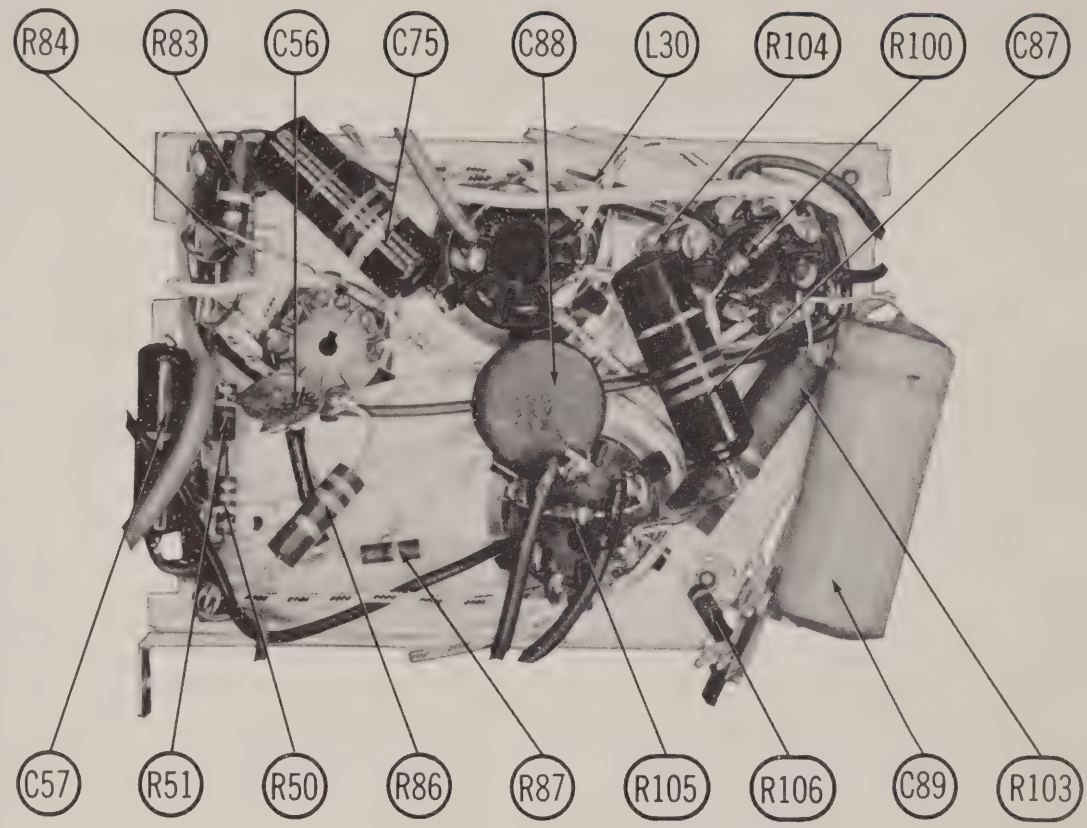
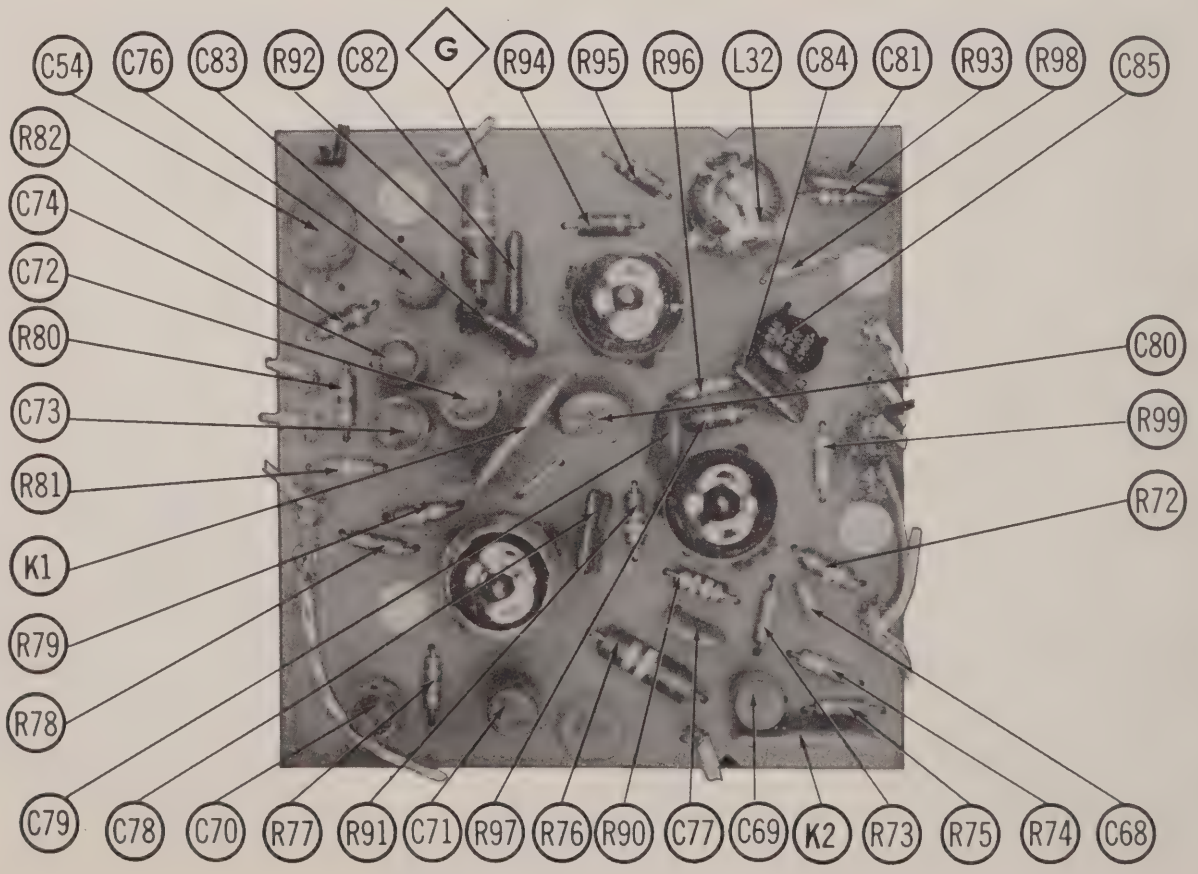
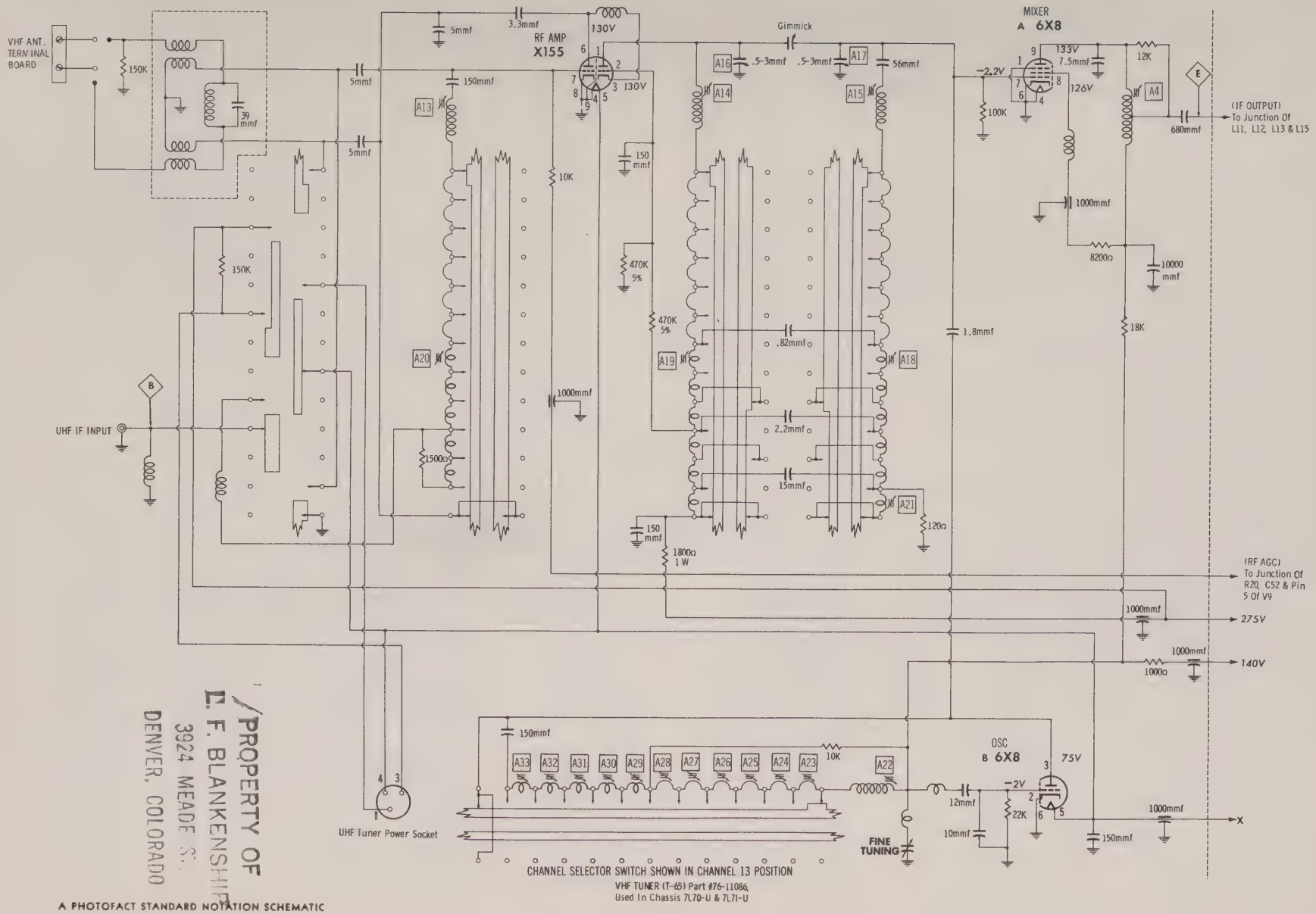


POWER SUB CHASSIS



OSCILLATOR PRINTED BOARD



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ALTERNATE TUNER SCHEMATIC

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ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis.

VIDEO IF ALIGNMENT

Connect the negative lead of a 5 volt bias supply to point Ⓐ. Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	1500MMF	High side to point Ⓑ. Low side to chassis.	Not used	41.25MC (400∿ AM Mod)	(T67 Tuner) 4 (T65 Tuner) UHF	Vert. Amp. thru 10K to point Ⓒ. Low side to chassis.	A1	Adjust for MINIMUM 400∿ indication. Bias may be reduced as MINIMUM is approached.
2.	"	"	"	47.25MC	"	"	A2, A3	"
3.	"	"	"	45.75MC	"	"	A4	Adjust for maximum 400∿ indication.
4.	"	"	"	42.7MC	"	"	A5, A6	"
5.	"	"	"	45.0MC	"	"	A7	"
6.	"	"	"	44.4MC	"	"	A8	"
7.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	"	65.75MC (400∿ 30% AM Mod)	4	"		Adjust fine tuning for MINIMUM 400∿ indication.
8.	"	"	69MC (10MC Swp)	67.25MC 70.5MC	"	"		Check for response curve similar to Fig. 1 with markers as indicated. If necessary, retouch A4 and A7 to correct low frequency side of curve. A6 to correct high frequency side and A8 to level top of curve. DO NOT change other adjustments.

SOUND IF ALIGNMENT

Keep generator output low enough that the voltage obtained in step 10 remains below 40 volts.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
9.	.01MFD	High side to point Ⓒ. Low side to chassis.	4.5MC (400∿ AM Mod)	Any non-interfering channel	DC probe to point Ⓓ. Common to chassis.	A9	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. Use first zero point from full counter clockwise position of A9 slug.
10.	"	"	"	"	DC probe to pin 3 (cathode of diode) of 6BY8 (V8). Common to pin 8 (screen of pentode) of 6BY8 (V8).	A10, A11	Adjust for maximum deflection. It is possible to obtain two peaks while adjusting A11. Use peak with slug nearest bottom of coil.

4.5MC TRAP ALIGNMENT

Remove horizontal output tube (V15) and 1st. video IF amplifier (V3).

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	.01MFD	High side to point Ⓒ. Low side to chassis.	Not used	4.5MC (400∿ AM 30% Mod)	Any non-interfering channel	Vert. Amp. thru high freq. probe to pin 2 (grid) of picture tube. Low side to chassis.	A12	Adjust for MINIMUM indication on scope. Replace V3 and V15 in their respective sockets.

VHF RF AND MIXER ALIGNMENT

Connect the negative lead of a 1.5 volt bias supply to point Ⓕ. Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC	210MC	13	Vert. Amp. thru 10K to point Ⓑ on T67 tuners or point Ⓔ on T65 tuners.	A13	Adjust for maximum amplitude.
13.	"	"	"	211.25MC 215.75MC	"	"	A14, A15	Adjust for maximum gain and symmetry of response similar to Fig. 2 with markers as shown. Adjust A14 to set marker level. Adjust A15 for proper tilt.
14.	"	"	177MC	174MC 180MC	7	"	A16, A17	Adjust for correct tilt. Recheck step 14 and retouch, if necessary. Repeat step 15.
15.	"	"	85MC	82MC 88MC	6	"	A18, A19, A20	Turn A18 SLIGHTLY counter clockwise until single peak appears. Adjust A19 until peak appears at 85MC. Adjust A20 for maximum gain and symmetry of single peak. Retouch A18 and A19 for symmetrical response centered about 85MC.
16.	1500 MMF	High side to point Ⓑ. (T65 tuners only) Low side to chassis.	43.5MC	43.5MC	UHF	"	A21	Adjust for flat response.

ALIGNMENT INSTRUCTIONS (cont)

VHF OSCILLATOR ALIGNMENT

Connect bias as under "VHF RF & Mixer Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning to the center of its range.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
17.	Direct	Across antenna terminals.	Not used	257MC (Unmod)	13	Vert. Amp. thru 10K to point (B) on T67 tuners or point (E) on T65 tuners. Low side to chassis.	A22	Adjust for zero beat on scope.
				251MC	12		A23	
				245MC	11		A24	
				239MC	10		A25	
				233MC	9		A26	
				227MC	8		A27	
				221MC	7		A28	
				129MC	6		A29	
				123MC	5		A30	
				113MC	4		A31	
				107MC	3		A32	
				101MC	2		A33	

UHF TUNER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

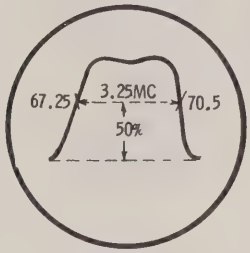


FIG.1

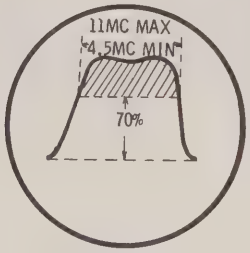
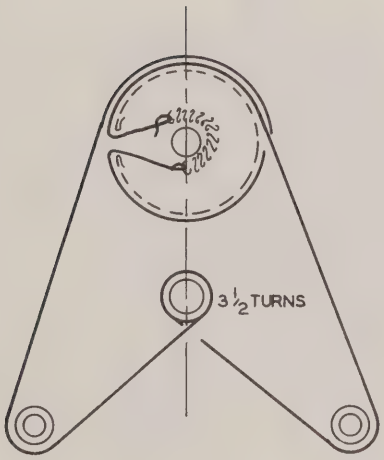
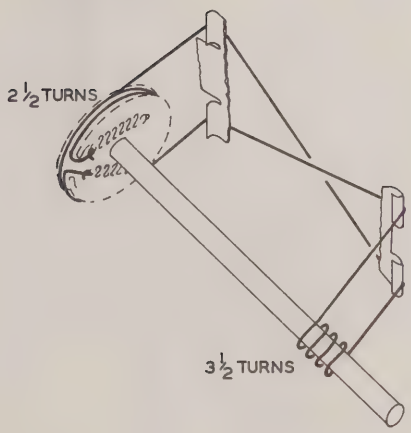


FIG.2

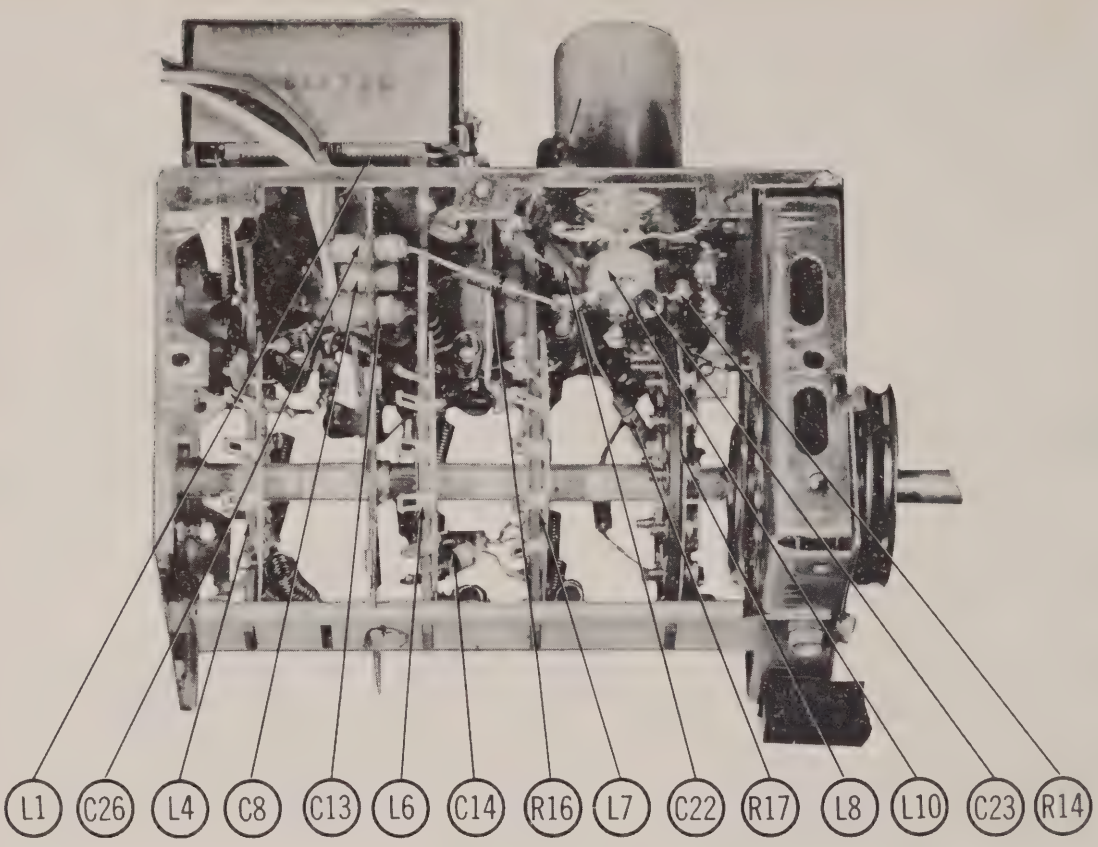


UHF DIAL

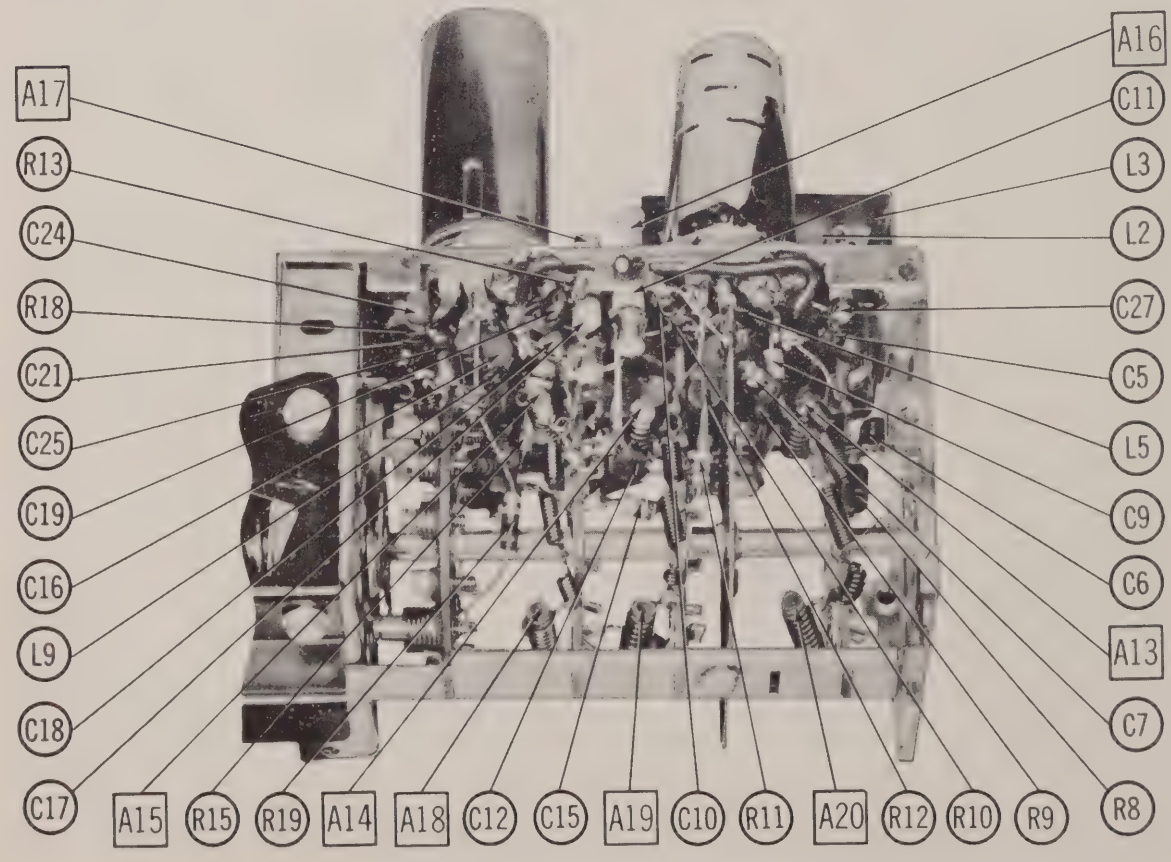


VHF FINE TUNING

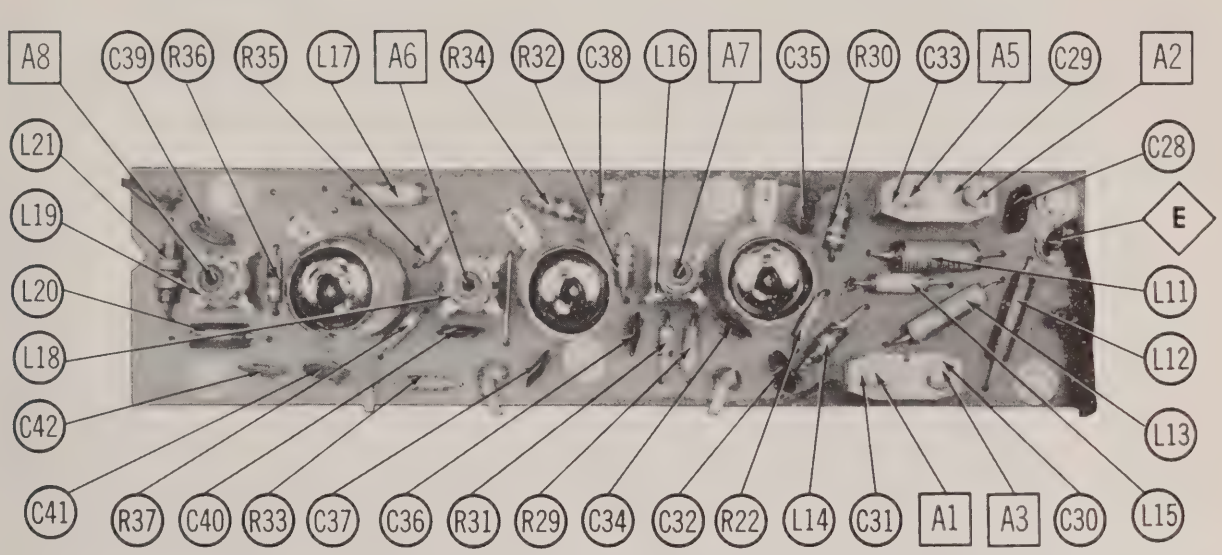
DRIVE CORD STRINGING



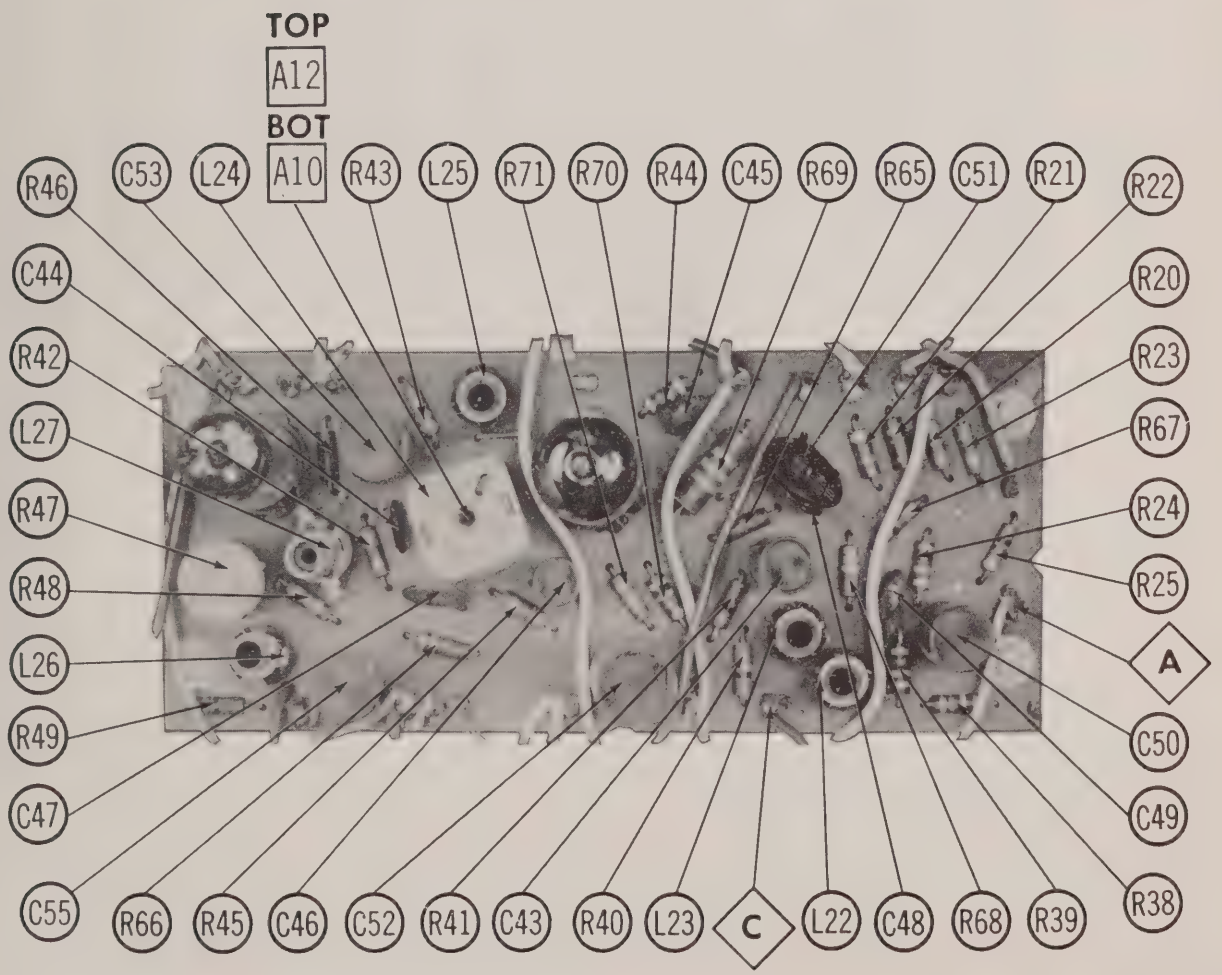
RF TUNER-LEFT SIDE



RF TUNER-RIGHT SIDE



VIDEO IF PRINTED BOARD

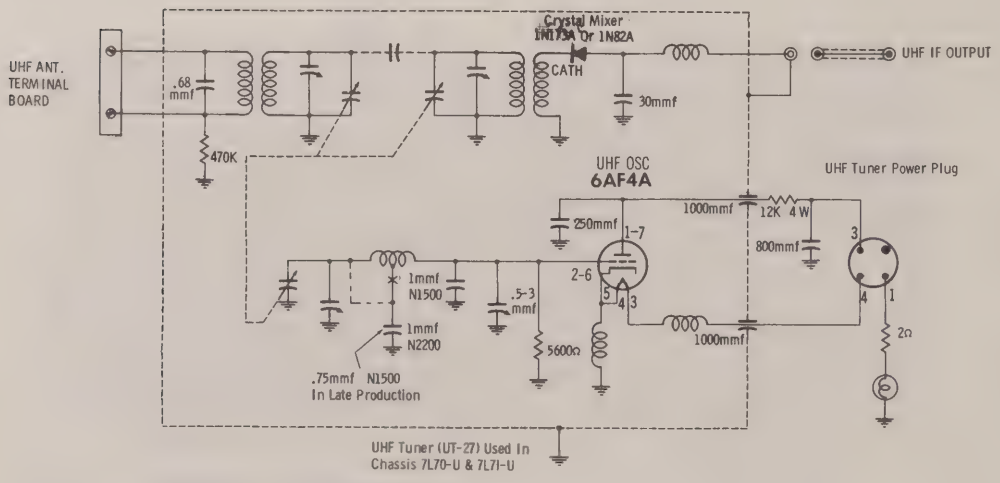


VIDEO PRINTED BOARD

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	X-155	†1800Ω	230K	INF	0Ω	.1Ω	INF	3Meg	0Ω	0Ω
V2	6X8	0Ω	22K	†20K	0Ω	.1Ω	0Ω	100K	†11K	†3000Ω
V3	6DE6	400K	47Ω	0Ω	.1Ω	†2700Ω	†2700Ω	0Ω		
V4	6DE6	400K	68Ω	0Ω	.1Ω	†2400Ω	†2400Ω	0Ω		
V5	6AM8	220Ω	.1Ω	†3000Ω	.1Ω	0Ω	†3000Ω	.1Ω	3900Ω	0Ω
V6	6U8	†20K	1Meg	†6700Ω	0Ω	.1Ω	†8600Ω	150Ω	4200Ω	3Meg
V7	6AQ5	1.7Meg	• 700Ω	.1Ω	0Ω	†3300Ω	†41Ω	1.7Meg		
V8	6BY8	47K	0Ω	†145K	0Ω	.1Ω	†27K	†27K	†27K	330Ω
V9	6AV6	10Meg	0Ω	0Ω	.1Ω	2.8Meg	400K	†220K		
V10	6AQ5	470K	680Ω	.1Ω	0Ω	†1200Ω	†720Ω	470K		
V11	12BR7	†35K	1.3Meg	0Ω	0Ω	0Ω	1Meg	0Ω	390K	.1Ω
V12	12AU7A	‡280K	1Meg	560Ω	.1Ω	.1Ω	• ‡1.3Meg	• 3Meg	560Ω	0Ω
V13	6CM6	†370Ω	TP	2Meg	.1Ω	0Ω	TP	390Ω	NC	†800Ω
V14	12AU7A	†19K	5Meg	1200Ω	.1Ω	.1Ω	†50K	• 190K	1200Ω	0Ω
V15	6DQ6	TP	.1Ω	NC	• †3900Ω	1.7Meg	TP	0Ω	0Ω	TOP CAP ‡29Ω
V16	6AU4GT	TP	TP	¶	NC	†42Ω	NC	.1Ω	0Ω	
V17	1B3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP ‡400Ω
V18	5U4GB	NC	30K	NC	19Ω	TP	23Ω	NC	30K	
V19	24ADP4	0Ω	1Meg	PIN 10 ‡2.7Meg	PIN 11 190K	PIN 12 .1Ω				

† MEASURED FROM PIN 2 OF V18.
‡ MEASURED FROM PIN 3 OF V16.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
¶ THIS READING CAN VARY GREATLY, (10K MINIMUM), DUE TO THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
TP TIE POINT
NC NO CONNECTION



A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1957

ALTERNATE TUNER SCHEMATIC

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

CHASSIS TOP VIEW

PHILCO MODELS E42085, E4605, C, T, E4607, L, T, E6606, E6608TN, E6610L, M, UE42085, UE4605, C, T, UE4607, L, T, UE6606, UE6608TN, UE6610L, M (Ch. 7L70, U, 7L71, U)

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	X-155	
V2	Mixer-Oscillator	6X8	
V3	1st Video IF Amp	6DE8	
V4	2nd Video IF Amp	6DE8	
V5	3rd Video IF Amp - Video Detector	6AM8	
V6	Video Amp - Noise Inv	6U8	
V7	Video Output	6AQ8	
V8	Sound IF Amp -Limiter	6BY8	
V9	AF Amp -AGC Clamper	6AV5	
V10	Audio Output	6AQ6	
V11	Sync Sep -Horiz. AFC	12BH7	
V12	Vert Mult	12AU7A	
V13	Vert. Output	6CM6	
V14	Horiz Mult	12AU7A	
V15	Horiz Output	6BQ8	
V16	Damper	6AU4GT	
V17	HV Rectifier	1B3GT	
V18	LV Rectifier	5U4GB	

PICTURE TUBE

ITEM No.	REPLACEMENT DATA: PHILCO PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	NOTES
V19	24ADP4	24ADP4 1 24CP4A 1 24VP4A 1 24TP4 1	24ADP4 1	1. Aluminized 2. Silver screen '85
	21BTP4	21BTP4 1		
	21BSP4			

ELECTROLYTIC CAPACITORS

ITEM No.	RATING: CAP	VOLT	REPLACEMENT DATA: PHILCO PART No.	AEROVOX PART No.	CORNELL DUBILIER PART No.	MALLORY PART No.	PYRANOL PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	40	400	30-2590-13	AFH4-92-75		FP3X99 1 TC76		Q-020 MTD-4540	
B	80	350							
C	30	350							
C1B	80	475	30-2590-12	AFH3-47-50	BO3200 BR1250	FP1X1 TCD65	TMD-35 TD-10-500	D-180 MT-4710	
C	30	350							
C1A	50	25	30-2590-17	AFH3-08	BO070	WP055 TC29		D-025	TVL-2234
B	100	25							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP	VOLT	REPLACEMENT DATA: PHILCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C4	39		62-0394-09R1	NPO-S1 39	TCZ-3S	C1QQ39C	TCO-39			
C5	5		30-1224-78	NPO-S1 5	TCZ-4R7	C1QV5C	TCO-5	ZT-S5S	5TCCB-V47	
C7	5		30-1224-78	NPO-S1 5	TCZ-4R7	C1QV5C	TCO-5	ZT-S5S	5TCCB-V47	
C7	5		30-1224-78	NPO-S1 5	TCZ-4R7	C1QV5C	TCO-5	ZT-S5S	5TCCB-V47	
C8	1000		30-1245-8	MFT-1000	TCZ-102				5GSC-D	
C9	3 3		30-[illegible]-9	NPO-S1 3 3	TCZ-3R3	C1QV33C	TCO-3 3	ZT-S5S3	5TCCB-V33	
C10	150		30-1228-9	EF-001S	DD-15S	L10T1S	DD-15S	ED-15S	5GA-T1S	
C11	0 5- 3 0		31-8520-3		839-3		31S-D	CT565A	5GA-T1S	
C12	150		30-1228-9	EF-001S	DD-15S	L10T1S	ED-15D	UC-5S1S	5GA-T1S	
C13	1000		30-1245-8	EF-001	MFT-1000				5GSC-D	
C14	1 0		30-1232-19	NPO-S1 1 0	TCZ-1R0			TCO-1	5TCCB-V1	
C15	3 2		30-1231-6	NPO-S1 3 2	TCZ-3R2	C1QV32C	TCO-3 2		5TCCB-V32	
C16	5 1		30-1334-100							
C17	0 5- 3 0		31-8520-3		839-3		31S-D	CT565A		
C18	56		62-0564-09001	NPO-S1 56	TCZ-56	C1QQ56C	TCO-56			
C19	150		30-1228-9	EF-001S	DD-15S	L10T1S	ED-15D	UC-5S1S	5GA-T1S	
C20	1000		30-1245-8	EF-001	MFT-1000				5GSC-D	
C21	7 5		30-1251-10							
C22	10000		30-1235-3	BPD-01	DD-103	BYA8S1	ED-4D	D0C51	5HK-B1	
C23	680		62-1680010U	BPD-00068	DD-68S	BYA10T6S	ED-68D	UC-5368	5GA-T6S	
C24	10		30-1234-51	NPO-S1 10	TCZ-10	C1TA8Q1C	TCO-10	ZT-S41	5TCC-Q1	
C25	13		30-1255		TCZ-13	C1TA8Q1C	TCO-13			
C26	1000		30-1245-6	EF-001	MFT-1000				5GSC-D	
C27	1000		30-1245-6	EF-001	MFT-1000				5GSC-D	
C28	3 2		30-1253-3		TCN-3R2		TCT-3 2	ZT-S5S5		N750
C29	1 5		31-8520-18		839-5		31S-D			
C30	5 3		31-8520-21		839-3		31S-D			
C31	1 5		31-8520-19		839-5		31S-D			
C32	1500		30-1228-8	BPD-01S	DD-152	BYA10D1S	ED-001S	DC52S	5HK-D1S	
C33	1 5		31-8520-19		839-5		31S-D			
C34	680		30-1252-15	BPD-00068	DD-68S	BYA10T6S	ED-68D	UC-5368	5GA-T6S	
C35	470		30-1252-18	BPD-00047	DD-47S	BYA10T47	ED-47D	UC-5347	5GA-T47	
C36	1500		30-1252-4	BPD-001S	DD-152	BYA10D1S	ED-001S	DC52S	5HK-D1S	
C37	680		30-1252-15	BPD-00068	DD-68S	BYA10T6S	ED-68D	UC-5368	5GA-T6S	
C38	18		30-1253-2		TCZ-18	L10Q2S	ED-1S			10%
C39	680		30-1252-15	BPD-00068	DD-68S	BYA10T6S	ED-68D	UC-5368	5GA-T6S	
C40	1500		30-1252-8	BPD-001S	DD-152	BYA10D1S	ED-001S	DC52S	5HK-D1S	
C41	1500		30-1252-8	BPD-001S	DD-152	BYA10D1S	ED-001S	DC52S	5HK-D1S	
C42	5		30-1253	NPO-DI 5	TCZ-4R7	C1QV5C	TCO-5	ZT-S5S	5TCCB-V5	NP0
C43	047	200	30-4584-28			BC2S47Z		ACE647	5EE-S47	
C44	33		30-1253-3	NPO-DI 33	DE-33D	L10Q3S	ED-33	ZT-S433	5TCC-Q33	10%
C45	330		30-1252-21	BPD-00033	DD-331	L10T33	ED-330	UC-5333	5GA-T33	
C46	0029	200	30-4588-1							
C47	1000		30-1252-13	BPD-001	DD-102	BYA8S1	ED-1000	DC52I	5HK-D1	
C48	4700		30-1252-2	BPD-0047	DD-472	BYA10D47	ED-470	UC-5347	5GA-T47	
C49	470		30-1252-17	BPD-00047	DD-47S	BYA10T47	ED-47D	UC-5347	5GA-T47	
C50	200		30-4584-30			BC1P1J		ACE401	5EE-P10	
C51	10000		30-1235-1	BPD-01	DD-103	BYA8S1	ED-01	DC5U	5HK-B1	
C52	22	200	30-4584-32			BC2P2J		ACE4022	5EE-P22	
C53	047	400	30-4584-45			BC8S47		ACE647	5EE-S47	
C54	1	200	30-4584-20			BC2P1J		ACE401	5EE-P10	
C55	047	400	30-4584-45			BC8S47		ACE647	5EE-S47	
C56	10000	1000	30-4650-92	DAC-2T	DC6S-103	HVE1S81		GEM-1611	BL-S10	
C57	01	400	30-1323-6		61 10000	DE-10S	CUS4S1	GP-10000	GEM-41J	47M-S1
C58	100		30-1253-3		61-10000S01	DE-10S	CUS4S1	GP-101	GEM-41	5GA-T1
C59	2200		30-1252-7	BPD-0033	DD-332	BYA10D32	ED-0032	UC-5322	5HK-D32	
C60	4700		30-1252-2	BPD-0047	DD-472	BYA10D47	ED-0047	UC-5347	5HK-D47	
C61	47	200	30-4585-34			BC2P47J		ACE447	5EE-P47	
C62	470		30-1252-16	BPD-00047	DD-47I	BYA10T47	ED-47D	UC-5347	5GA-T47	
C63	3000		30-1238-16	BPD-003	DD-303	BYA10D3	ED-003	UC-533	5HK-D3	
C64	1	200	30-4671-30		DF-104	CUB2P1		GEM-301	2TM-P1	
C65	1000		30-1235-1	BPD-01	DD-103	BYA8S1	ED-01	D0C51	5HK-B1	
C66	4700		30-1252-2	BPD-0047	DD-472	BYA10D47	ED-0047	UC-5347	5HK-D47	
C67	01	1000	30-4668-72							
C68	150		30-1262-26	BPD-00015	DD-15I	L10T1S	ED-15D	UC-5315	5GA-T1S	
C69	02	400				BC8S2J		ACE247	40S-S02	Note 1
C70	022	300	30-4584-36			BC8S2J		ACE247	5EE-S22	

CAPACITORS (cont)

ITEM No.	RATING: CAP	VOLT	REPLACEMENT DATA: PHILCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C71	0033	400	30-4587-2			DC8S33J			45E-D33	
C72	033	400	30-4584-44			DC8S33J			45E-S33	
C73	033	400	30-4584-44			DC8S33J			45E-S33	
C74	015	200	30-4584-25			DC2S15J			2EK-S15	
C75	047	600	30-4650-82	BPD-05	DF-503	CUB5S47		GEM-6147	5TM-S47	
C76	022	200	30-4584-26			DC2S22J		ACE623	2EK-S22	
C77	68		30-1262-4	NPO-S1 68	D6-68D	L10Q6S	ED-6S		5TCC-Q68	10%
C78	120		30-1264-5	1469-00012		22S5T12			4S-312	10%
C79	1000		30-1252-13	BPD-001	DD-102	BYA8D1	ED-1000	DC52I	5HK-D1	
C80	1100		30-1252-12	BPD-001	DD-102	BYA8D1	ED-1000	DC52I	5HK-D1	
C81	2200		30-1252-7	1464-00032		22S5T32			M2-322	10%
C82	390		30-1264-1	1469-00039		22S5T39			M2-339	10%
C83	82		30-1264	1464-000082		22S5Q82			M2-482	10%
C84	330		30-1264-1	1469-00033		22S5T33			M2-339	10%
C85	4700		30-1262-3	BPD-0047	DD-472	BYA10D47	ED-0047	UC-5347	5HK-D47	
C86	10000		30-1235-2	BPD-01	DD-103	BYA8S1	ED-01	DC5I	5HK-B1	
C87	056	400	30-4650-45					GEM-6168	4TM-S68	
C88	100	4000	30-1246-13	HVD-50-100	DD50-10S	HVB50T1			50GA-T1	
C89	47	600		P45BN-47		CUB4P47		GEM-4047	4TM-P47	Note 2
C90	047	800	30-4650-62	BPD-05	DF-503	CUB5S47		GEM-6147	5TM-S47	

Note 1 Some versions may use a 02EMFD (Part #30-4584-36) in this application
Note 2 Not used in some versions.

CONTROLS

ITEM No	RATING: RESISTANCE	WATTS	REPLACEMENT DATA: PHILCO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	250K	1	33-5564-30	ABT-58	A47Z1-250K	Q1S-130		Volume - Tap ② 180K
B	Shaft			AK-7	FS-3	Not Req.		
C	Switch			KH-1	BWE-12	TS-1		
R2A	100K		33-5579-39	F1-S1		*Q1U-1088	U1H1H	Brightness
B	25K			RB-27			Not Req.	Vert. Lin
R3	50000	1	33-5587-90					Contrast - Note 1
R4A	50K		33-5573-34	F1-S8		*	UE833	Horiz. Hold
B	250K			R2-24		*	Not Req.	Aux. Horiz. Hold
R5A	3Meg		33-5579-28	F1-78		*	UE3254	Vert. Hold
B	2 5Meg			R2-76		*	Not Req.	Height
R6A	2 5K	2	33-5574	WN-252	A5S-15K	WP1Q2500	R1S4L	Width
B	Shaft			Not Req.	FSG-1/2	Not Req.	Not Req.	

Note 1. Some versions may use a 18000 control with the same part number in this application
* Concentrikit Equivalent, K-8 Kit, Base Elements & Shafts BU-18L, F13-18B (Panel)
BU-18S, R1S-005 (Rear)
* Concentrikit Equivalent, K-16 Kit, Base Elements & Shafts BU-18L, F13-18B (Panel)
BU-29, R1S-005 (Rear)
† Concentrikit Equivalent, K-18 Kit, Base Elements & Shafts BU-18L, F13-18B (Panel)
BU-12D, R1S-005 (Rear)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING: OHMS	WATT	REPLACEMENT DATA: PHILCO PART No.	IRC PART No.	NOTES
R7	180K		66-4153-40	BTS-180K	
R8	1500		66-2153-40	BTS-1500	
R9	10K		66-3103-40	BTS-10K	
R10	470K	5%	66-4473-40	BTS-470K 5%	
R11	470K	5%	66-4473-40	BTS-470K 5%	
R12	2000	1	66-2162-29	BTA-2000	
R13	100K		66-4103-40	BTS-100K	
R14	33K		66-3123-40	BTS-33K	
R15	8200Ω		66-2823-40	BTS-8200	
R16	100Ω		66-2103-40	BTS-100	
R17	180K		66-4183-40	BTS-180K	
R18	33K		66-3323-40	BTS-33K	
R19	10K		66-3103-40	BTS-10K	
R20	2.2Meg		66-5226-40	BTS-2.2Meg	
R21	1 5Meg		66-5158-40		Note 1
R22	12Meg	5%	66-8128-40		
R23	1.5Meg		66-5158-40	BTS-1.5Meg	
R24	3 3K		66-3332-40		
R25	10Meg		66-5108-40	BTS-10Meg	
R26	680K		66-4683-40	BTS-680K	
R27	220K		66-4223-40	BTS-220 K	
R28	22K		66-3223-40	BTS-22K	
R29	330Ω		66-1333-40	BTS-330	
R30	47Ω		66-0473-40	BTS-47	
R31	1000Ω		66-2103-40	BTS-1000	
R32	27K		66-3273-40		
R33	330Ω		66-1333-40	BTS-330	
R34	68Ω		66-0683-40	BTS-68	
R35	15K		66-3153-40	BTS-15K	
R36	100Ω		66-2103-40	BTS-1000	
R37	330Ω		66-1333-40	BTS-330	
R38	2200Ω		66-2223-40	BTS-2200	
R39	470K		66-4473-40	BTS-470K	
R40	10K		66-3103-40	BTS-10K	
R41	1Meg		66-5106-40	BTS-1Meg	
R42	3300Ω		66-2333-40	BTS-3300	
R43	3300Ω		66-2333-40	BTS-3300	
R44	4700Ω		66-2473-40	BTS-4700	
R45	150Ω		66-1153-40	BTS-150	
R46	1Meg		66-5108-40	BTS-1Meg	
R47	330Ω	7	33-5445-1	PWF-3300	
R48	6800Ω		66-2683-40	BTS-6800	
R49	1Meg		66-5108-40	BTS-1Meg	
R50	180K		66-4183-40	BTS-180K	
R51	39K		66-3393-40	BTS-39K	Note 2
R52	47K		66-3473-40	BTS-47K	
R53	330Ω		66-1333-40	BTS-330	
R54	180K		66-4183-40	BTS-180K	
R55	27K		66-3273-40	BTS-27K	
R56	27K		66-3273-40	BTS-27K	
R57	27K		66-3273-40	BTS-27K	
R58	10K		66-3103-40	BTS-10K	
R59	6800Ω		66-2683-40	BTS-6800	
R60	10Meg		66-5106-40	BTS-10Meg	
R61	220K		66-4223-40	BTS-220K	
R62	680Ω	1	66-1683-40	BTS-680	
R63	68Ω	1	66-1683-40	BTS-68	
R64	15K		66-3153-40	BTS-15K	
R65	2.5Meg		66-5258-40	BTS-2.5Meg	
R66	330K		66-4333-40	BTS-330K	
R67	470Ω	1	66-1473-40	BTS-470	
R68	330K		66-4333-40	BTS-330K	
R69	47K	1	66-3473-40	BTS-47K	
R70	4700Ω	5%	66-2472-40	BTS-4700 5%	
R71	68K		66-3683-40	BTS-68K	
R72	150K		66-4153-40	BTS-150K	
R73	8200Ω		66-2823-40	BTS-8200	
R74	27K		66-3273-40	BTS-27K	
R75	6800Ω		66-2683-40	BTS 6800	
R76	220K	1	66-4223-40	BTS-220K	
R77	5600	5%	66-1568240	BTS-560 5%	
R78	1.5Meg	5%	66-5158240	BTS-1 5Meg 5%	
R79	220K		66-4223-40	BTS-220K	
R80	1.5Meg		66-5158-40	BTS-1 5Meg	
R81	220K		66-4223-40	BTS-220K	
R82	750K	5%	66-4754240	BTS-750 5%	
R83	110K	5%	66-4114240	BTA-110K 5%	
R84	33K	1	66-3333-40	BTA-33K	
R85	390Ω	1	66-1393-40	BTA-390	
R86	330Ω	1	66-1334-40	BTA-330	
R87	10K		66-3103-40	BTS-10K	
R88	1000Ω				
R89	1000Ω				
R90	390K		66-4393-40		
R91	680K		66-4683-40		
R92	15K	1	66-3154-40		
R93	98K				
R94	2000Ω		66-2203-40		
R95	56K		66-3563-40		
R96	39K			BTS-39K	
R97	6800Ω		66-2683-40		
R98	8200Ω		66-2823-40	BTS-8200	
R99	4700Ω		66-2473-40	BTS-4700	
R100	1Meg	5%		BTS-1Meg 5%	
R101	3000Ω	7		PWF-3000	Note 4
R102	4700Ω		66-2473-40	BTS-4700	
R103	56K	2	66-3563-40	BTS-56K	
R104	100K	1	66-4104-40	BTA-100K	
R106	12K		66-3123-40		
R106	2.7Meg			BTS-2 7Meg	Note 5
R107	2000Ω	10	33-1262-5	PW10-2000	
R108	470K		66-4473-40	BTS-470K	

Note 1. Manufacturer recommends 5% replacement.
Note 2. Some versions may use 33K (Part #66-3336240)in this application.
Note 3. Some versions may use 27K, 1W (Part #66-3274540) in this application.
Note 4. Some versions may use 6500Ω, 7W (Part #33-1535-16) in this application.
Note 5. Some versions may use 4.7Meg (Part #66-5478340) in this application.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	SEC. 1	SEC. 2	SEC. 3	REPLACEMENT DATA: PHILCO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC	580VCT	5V	18VCT	32-8786					
	1A	275A	3A	5A						

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: PHILCO PART No.	Halldorson PART No.	Merit PART No.	RCA TYPE No.	Rem PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T2	Vert. Output	32-8758	Z1900 1 2	A-2823 2	2356A	V31E 3 4	A-8467 3	28S72 ③	118X
T3A	Yoke-Horiz (21 5MH)	76-9173-13 ①	DF507	MDF-92		Y90F19/43	DY-48A		Y-41 &
B	(30?)-Vert (45MH)		5 7 5	5 7 5		DY-48	5 7 5	T-16	NW98 ②
T4	Horiz. Output	32-8757		HVO-52 3 *1		X248 * 1	BO-384 * 1		

① Use 7 to 1 turns ratio.
② Connect as autoformer
③ Drill new mounting hole(s)
④ Cut and tape blanking lead
⑤ Includes resistors R88 and R89
⑥ Use original yoke clamp and centering device
① Connect yoke terminal #1 to yoke plug pin #8, terminals #2 and #7 to yoke plug #2, terminal #3 to yoke plug pin "3".
② Use original yoke damping network
This part may be superceded by Parts Manufacturer's introduction of special unit for this application.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL (CHASSIS)	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Rem Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
7		1		2	12		
4	3	1		11			
5	3		1	12			
3	7		4	6			
1	4		7	8 or 9			

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	SEC	REPLACEMENT DATA: PHILCO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T5	6000Ω	2.5Ω tap @ 10%	33-8777 ①						① Part No. 33-8786 used in some versions

SPEAKER

ITEM No.	TYPE: SIZE	FIELD	V. C. IMP	REPLACEMENT DATA: PHILCO PART No.	QUAM PART No.	NOTES
SP1	3½"x8"	PM	6-8Ω	30-1667-3 1 2		① Parallel and phase
SP2	4" x 8"	PM	3-4Ω	30-1633-1 3 4	4BAI ③	② Used in Models E4607, UE4607, E4607L, UE4607L, E4607T, UE4607T
				30-1643-5 3 4	5AI2S	③ Used in Models E6506, UE6506
				30-1687-1 3 4		④ Used in Models UE6605, E6605, E6605T, UE6605T, E6605L, UE6605L
				45-9171 3 4		⑤ Used in Models E4308R, UE4308R
				30-1633-8 3 4		⑥ Used in Model UE6608R, E6608TR
				30-1631-1 3 4		⑦ Used in Models E6610M, UE6610M, E6610L, UE6610L
	4" x 6"	PM	3-4Ω			

COILS (RF-IF)

ITEM No.	USE	PHILCO PART No.	NOTES
L1	Ant. Coil	32-4527	
L2	Ant. Coil	32-4537	
L3	1F Trap	32-4519	
L4	Ant. Coils	32S-0085	Channel 2-13, complete wafer assembly
L5	RF Choke	32-4623-95	Channel 2-13, complete wafer assembly
L6	RF Coils	32S-0083	

ITEM No.	USE	PHILCO PART No.	NOTES
L7	Mixer Grid Coils	32S-0085	Channel 2-13, complete wafer assembly
L8	Osc. Coils	32S-0084	Channel 2-13, complete wafer assembly
L9	Mixer Screen Coil	32-4623-93	
L10	Mixer Plate Coil	32-4639-4	

ITEM No.	USE	REPLACEMENT DATA: PHILCO PART No.	MEISSNER PART No.	MERIT PART No.	MULLER PART No.	NOTES
L11	47.25MC Trap Coil	32-4645-1				2.7 Microhenries
L12	47.25MC Trap Coil	32-4645-1				2.7 Microhenries
L13	41.3MC Trap Coil	32-4645-3	19-1005	BC-583	4806	2.4 Microhenries
L14	1F Coupling Coil	32-4645-5				.33 Microhenry
L15	1st. Video IF	32-4645-3				
L16	2nd. Video IF	32-4644-3				
L17	Vid. Choke	32-4645-6	19-1003	BC-583	4806	2.8 Microhenries
L18	3rd. Video IF	32-4644-6				
L19	4th. Video IF	32-4644-7				
L20	Resonant Choke	32-4645-7				2 Microhenries
L21	RF Choke	32-4676-1	19-0033		6151	22 Microhenries
L22	Shunt Peaking Coil	32-4690-7	19-3260	TY-185	6154	330 Microhenries
L23	Series Peaking Coil	32-4690-3	19-3100	TY-181	6115	100 Microhenries
L24A	4.5MC Trap	32-4688-1				
B	Sound IF					
L25	Shunt Peaking Coil	32-4690-5	19-3180	TY-196	6130	150 Microhenries
L26	Series Peaking Coil	32-4690-3	19-3100	TY-181	6115	100 Microhenries
L27	Shunt Peaking Coil	32-4694-4				75-235 Microhenries
L28	Sound Discriminator	32-4691-1				Includes Cage.
L29	RF Choke	32-4183-50	19-1005	BC-566	6833	60MC, 11 Microhenries
L30	RF Choke	32-4115-50	19-1005	BC-566	6833	85MC, 6 Microhenries
L31	RF Choke				6183	16 Microhenries, wound on 100 resistor

PHILCO MODELS 14J305, E4405, C, T, E4407, L, T, E4406, E4408TN, E5610L, M, UE4308S, UE4405, C, T, E4407, L, T, E4406, E4408TN, UE5610L, M, UE6608TN, UE6610L, M (Ch. 7U70, U, 7L71, U)

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.		REPLACEMENT DATA							NOTES
	PRI.	SEC.	PHILCO PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Ram PART No.	Thordarson PART No.	
L32	165Ω		32-4672-3							30-88 Millihenries

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	PHILCO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L33	.270A	41Ω	1.2 HY.	32-8755	C5037 ①	C-2974	C-2326 ①	26C44	C-23X

① Drill one new mounting hole.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	PHILCO PART No.	REPLACEMENT DATA
K1	Phase Compensation Filter	1000MMF, 14000MMF, 4.7Meg, 220K	30-6009-4 ①	Centralab PC-307
K2	Vert. Integrator	4000MMF, 10000MMF, 10000MMF, 10K, 10K, 10K, 1Meg	30-6008-2 ②	Centralab PC-306 Sprague 101C-19

① Alternate part #30-6009-3.
② Alternate part #30-6008-1.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			PHILCO PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	N	7/10 250V S/B		76-11051-3	333.750 (N 3/4A 125V S/B)	346010	N 7/10	HN 1/2 to 3/4

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		PHILCO PART No.	CBS PART No.	SYLVANIA PART No.	
M2	1N60	34-8022	1N60	1N60	Audio Detector
M3	1N60	34-8022	1N60	1N60	Audio Detector

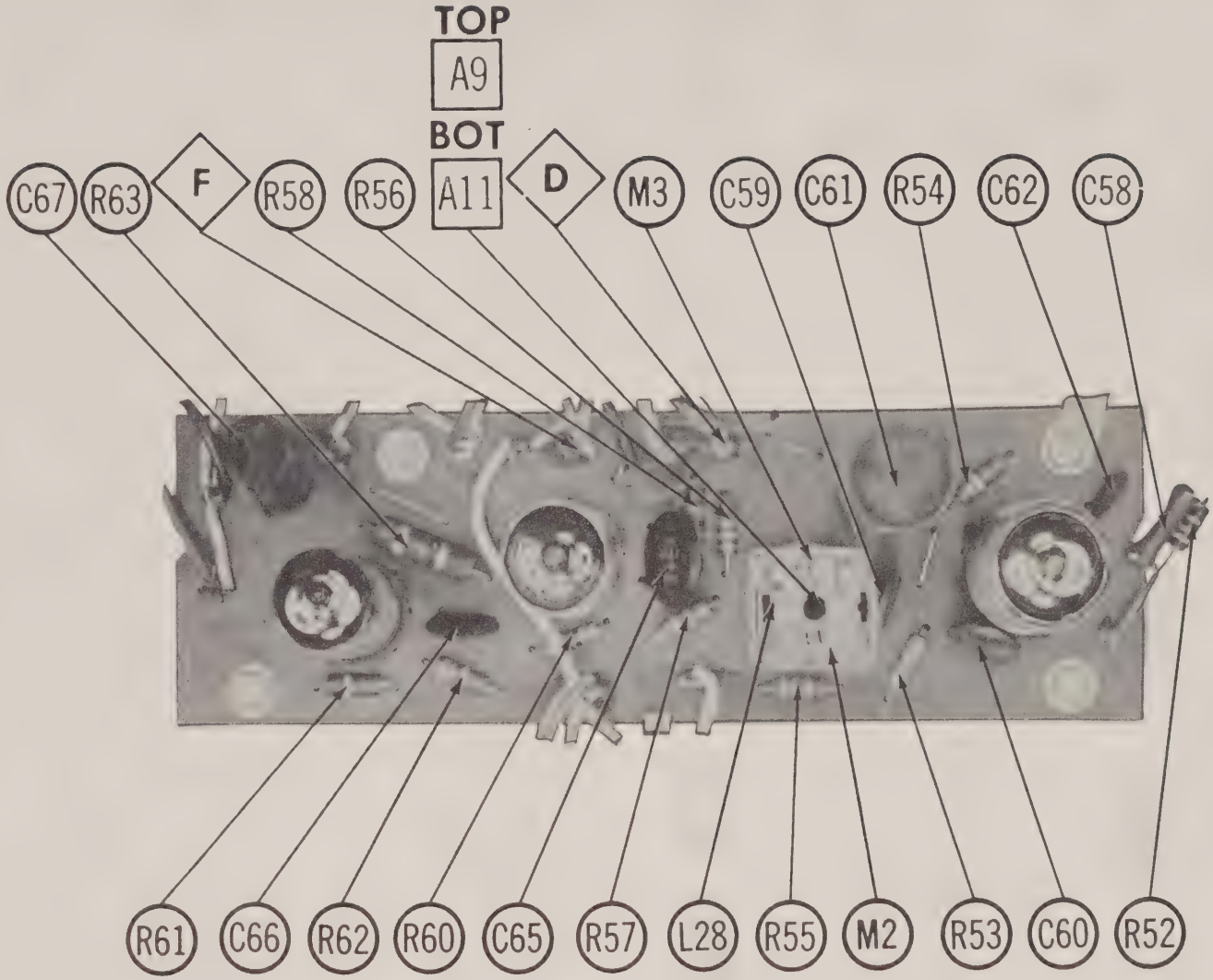
MISCELLANEOUS

ITEM No.	PART NAME	PHILCO PART No.	NOTES
M4	Pilot Light	34-2040	Type #51
M5	Tuner	76-11191	VHF (T67) Ch. 7L70, 7L71
	Tuner	76-11086	VHF (T65) Ch. 7L70U, 7L71U
	Tuner		UHF Adaptor (UT-27) Ch. 7L70U, 7L71U
M6	Switch	42-2063	Range (Rotary wafer type)
M7	Switch		On-off (push type)
M8	Switch	42-2064	Stepper Attenuator (Channel Selector)
M9	Motor	41-2067	Stepper
M10	Focus Assembly	76-11134	Includes centering device
M11	Ion Trap	76-6077-2	
	Printed Circuit Board	54-9826	IF Panel (less components)
	Printed Circuit Board	54-9853	Video Panel (less components)
	Printed Circuit Board	54-9854	Sound Panel (less components)
	Printed Circuit Board	54-9855	Oscillator Panel (less components)

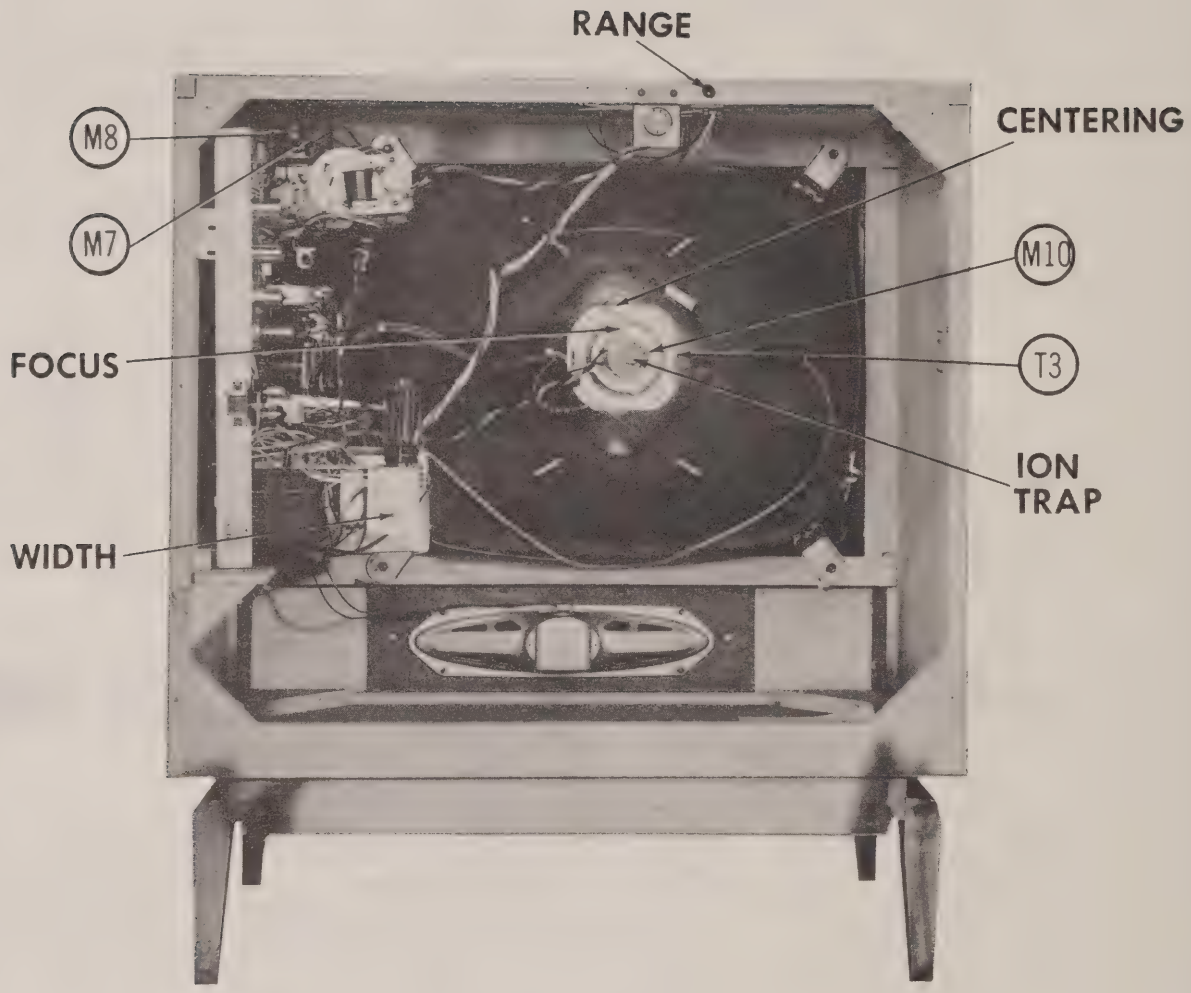
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Safety Glass	54-9213-66	Models E6606, UE6606, E6608TN, UE6608TN, E6610M, UE6610M, E6610L, UE6610L
Safety Glass	54-9213-52	Models E4605, C, T, UE4605, C, T, E4208S, UE4208S
Safety Glass	54-9213-69	Models E4607, L, T, UE4607, L, T
Mask	54-6303-1	Models E6608TN, UE6608TN, E6610L, M, UE6610L, M
Mask	54-6303-3	Models E6606, UE6606
Mask	54-6296-4	Models E4605, C, T, UE4605, C, T, E4208S, UE4208S, E4607, L, T, UE4607, L, T
Knob	28-11353-1	Channel Selector (Models E6606, UE6606, E4605, C, T, UE4605, C, T, E4208S, UE4208S, UE6608TN, E6610L, M, UE6610L, M, E6608TN, E4607, L, T, UE4607, L, T)
Knob	54-6297-2	Fine Tuning (Models E6608TN, UE6608TN, E6610L, M, UE6610L, M
Knob	54-6297-3	Fine Tuning (Models E6606, UE6606, E4605, C, T, UE4605, C, T, E4607, L, T, UE4607, L, T)
Knob	54-6297-1	Fine Tuning (Models E4208S, UE4208S)
Knob	54-6299-5	On-off-volume (Models E6608TN, UE6208TN, E6610L, M, UE6610L, M)
Knob	54-6299-7	On-off-volume (Models E6606, UE6606, E4605, C, UE4605, C, E4607, L,) UE4607, L)
Knob	54-6299-8	On-off-volume (Models E4605T, UE4605T, E4607T)
Knob	54-6299-1	On-off-volume (Models E4208S, UE4208S)
Knob	54-6300-1	4 Used - Contrast, Horiz. Hold, Vert. Hold (Models E6608TN, E4208S, UE4208S, UE6608TN, E6610L, M, UE6610L, M)
Knob	54-6300-5	4 Used - Contrast, Horiz. Hold, Vert. Hold (Models E6606, UE6606, E4605, C, T, UE4605, C, T, E4607, L, T, UE4607, L, T)
Knob	54-6298-1	Fringe (Models E6608TN, E4208S, UE4208S, UE6608TN, E6610L, M, UE6610L, M
Knob	54-6298-2	Fringe (Models E6606, UE6606, E4605, C, T, UE4605, C, T, E4607, L, T, UE4607, L, T)



SOUND PRINTED BOARD



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern.

Turn the contrast control counter clockwise until the blanking is visible.

Set the horizontal hold control to the center of its range.

Short out the horizontal frequency coil by connecting a .1MFD capacitor from point ⓖ to chassis.

Adjust auxiliary horizontal hold control until equal blanking appears on each side of the raster. This can be seen by decentering the picture one way, then the other by moving the wobble plate.

Remove the shorting capacitor.

Adjust the horizontal frequency slug (B1) until the picture is brought into sync with equal blanking on each side of the screen. The wobble plate is used as in step 4.

Check the pull-in by turning the horizontal hold control until the picture goes out of sync and then slowly bring the picture back into sync. The pull-in should occur between $2\frac{1}{2}$ and 3 bars. If pull-in is not correct, repeat the above steps.

Adjust the width control (R6) for a picture slightly wider than necessary to fill the picture mask horizontally.

SILVERTONE MODELS
7053, B, 7054, B (Ch. 528.47300)

MODEL 7053

PROPERTY OF
E. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

SILVERTONE MODELS
7053, B, 7054, B (Ch. 528.47300)

TRADE NAME	Silvertone Models 7053, 7053B, 7054, 7054B (Ch. 528.47300)
SUPPLIER	Sears, Roebuck & Co., 925 S. Homan Ave., Chicago, Illinois
TYPE SET	AC Operated AM Receiver With 4 Speed Automatic Record Changer
TUBES (Six)	Types 12BE6 Converter, 12BA6 IF Amplifier, 12AT6 Det.-AVC-AF Amp., 12AT6 Phase Inverter, (2) 35C5 Output
POWER SUPPLY	110-120 Volts AC - 60 Cycles — RATING .33 Amp. @ 117 Volts AC, 30 Watts (With Motor)
TUNING RANGE—BROADCAST	540KC - 1630KC — SHORT WAVE

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.1MFD	High side to pin 7 (grid) of 12BE6 (V1). Low side to chassis.	455KC (400~ Mod)	Tuning gang fully open	Across Voice Coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2	"	"	1630KC	"	"	A5	"
3		Loop	1400KC	1400KC	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

FOR SERVICE INFORMATION ON RECORD CHANGER 567.40002, 567.40102, 567.41000 OR 567.41100 — SEE PHOTOFACT SET 365 FOLDER 13

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of H173

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PARTS LIST AND DESCRIPTIONS

SILVERTONE MODEL 7053

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	12BE6	
V2	IF Amplifier	12BA6	
V3	Det. -AVC- AF Amp.	12AT6	
V4	Phase Inverter	12AT6	
V5	Output	35C5	
V6	Output	35C5	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	SILVERTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■70	150	18-9-4	AFH2-19	XB0181	FP216	TMD-16	D-085	TVL-2439
B	▲30	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	4-70		20-143							
C3	.05	200	16-50323	P288N-05	DF-503	CUB2S5		GEM-415	2TM-S5	
C4	47		15-47016	BPD-000047	DD-470	L10Q47	ED-47	UC-5447	5GA-Q47	
C5	.05	200	16-50323	P288N-05	DF-503	CUB2S5		GEM-415	2TM-S5	
C6	150		15-15116	BPD-00015	DD-151	L10T15	ED-150	UC-5315	5GA-T15	
C7	.05	400	16-50343	P488N-05	DF-503	CUB4S5		GEM-415	4TM-S5	
C8	25	500	17-25015	1468-000025	D6-250	5W5Q25	ED-25	UC-5425	1FM-425	
C9	.02	400	16-20343	P488N-02	DD-203	CUB4S2	ED-02	GEM-412	4TM-S2	
C10	.02	400	16-20343	P488N-02	DD-203	CUB4S2	ED-02	GEM-412	4TM-S2	
C11	.01	400	16-10343	P488N-01	DD-103	CUB4S1	GP-10000	GEM-411	4TM-S1	
C12	.1	200	16-10423	P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	
C13	5000		15-50216	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C14	.001	600	16-10243	P688N-001	DD-102	CUB6D1	GP-1000	GEM-621	6TM-D1	
C15	.001	600	16-10243	P688N-001	DD-102	CUB6D1	GP-1000	GEM-621	6TM-D1	
C16	.05	400	16-50343	P488N-05	DF-503	CUB4S5		GEM-415	4TM-S5	
C17	.047	600	20-1447	P688N-047	DF-503	CUB6S47		GEM-6147	6TM-S47	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SILVERTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K	½	24-250	F1-40		♦	UF55L	Tone
B	1Meg	½		R2-61			UR16-T1253	Volume, Tap ⓐ 100K
C	Switch			KB-1			US-26	

♦ Concentrikit Equivalent; K-6 Kit, Base Elements and Shafts B11-133, P17-129 (Panel); B18-137X, R2-212 (Rear); 76-1 (Switch)

RESISTORS

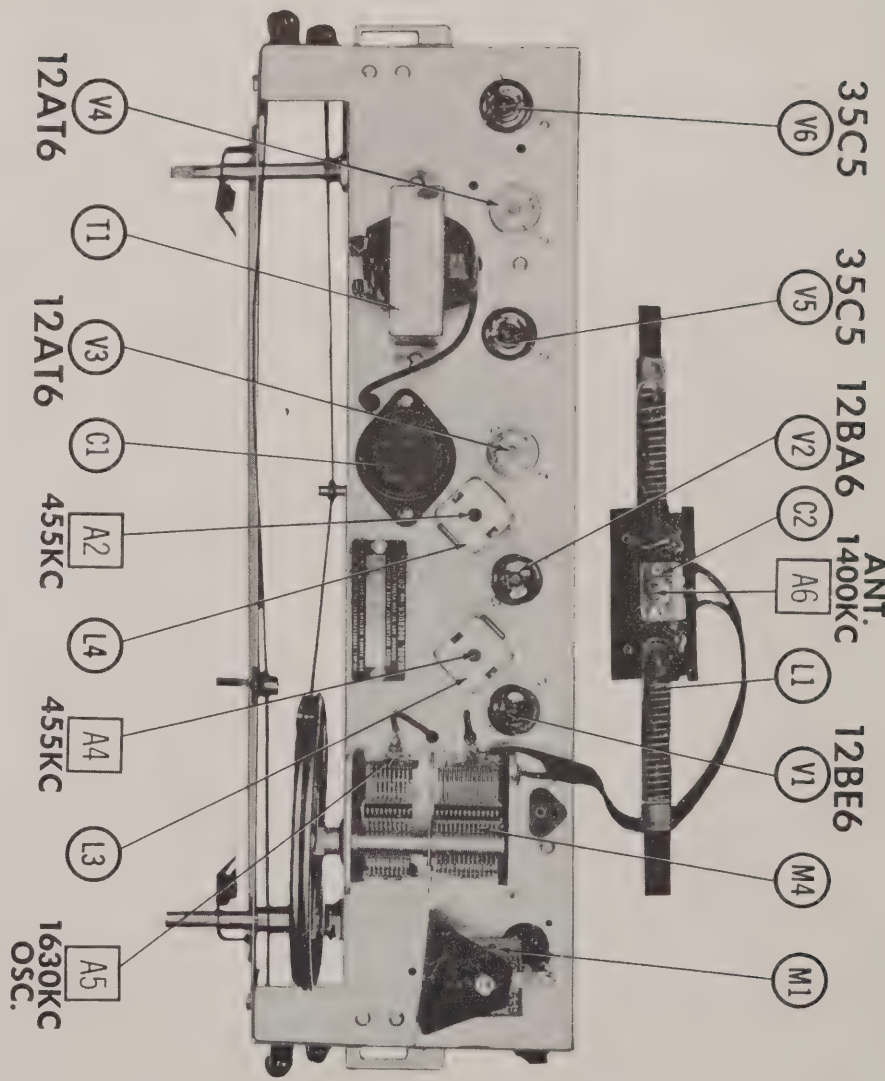
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SILVERTONE PART No.	IRC PART No.	
R2	22K		60-22301	BTS-22K	
R3	150Ω		60-15101	BTS-150	
R4	2.2Meg		60-22502	BTS-2.2Meg	
R5	47K		60-47301	BTS-47K	
R6	22K		60-22301	BTS-22K	
R7	10Meg		60-10602	BTS-10Meg	
R8	100K		60-10401	BTS-100K	
R9	10Meg		60-10602	BTS-10Meg	
R10	220K		60-22401	BTS-220K	
R11	100Ω		60-10101	BTS-100	
R12	1200Ω	1	60-12211	BTA-1200	
R13	33Ω	3	61-10		

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	6800Ω CT	6-8Ω	80-388	Z1002	A-2901	A-3823	24S61	S-53X	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	SILVERTONE PART No.	QUAM PART No.	
SP1 SP2	6" 6"	PM PM	3-4Ω 3-4Ω	012431 ① 012431 ①	6A21 6A21	① Connect in series and phase.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		SILVERTONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1 L2 L3 L4	Loop Stick Osc. Coil Input IF Output IF	82-72 10-645 10-508 10-479	 14-1074 16-6758 16-6758	 BC-352 BC-353	 12-C1 12-C2	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	SILVERTONE PART No.	REPLACEMENT DATA	
K1	Audio Coup. Net.	10000MMF, 250MMF, 500K, 250K	17-110	Aerovox Centralab Cornell-Dubilier Erie Sprague	PA-112-4 PC-81 113TM2 1404-02 T-2
K2	Audio Coup. Net.	10000MMF, 250MMF, 500K, 250K	17-110	Aerovox Centralab Cornell-Dubilier Erie Sprague	PA-112-4 PC-81 113TM2 1404-02 T-2

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	SILVERTONE PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.	
M1	.080A	80-780	1004A	RS100		100	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	SILVERTONE PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	MOUNT	
M2	720044 or 720091	55-T or * 81-TB	GD-J	56	PT-2	* Plug-in permanent needle cartridge includes mounting mechanism

PHONO NEEDLE

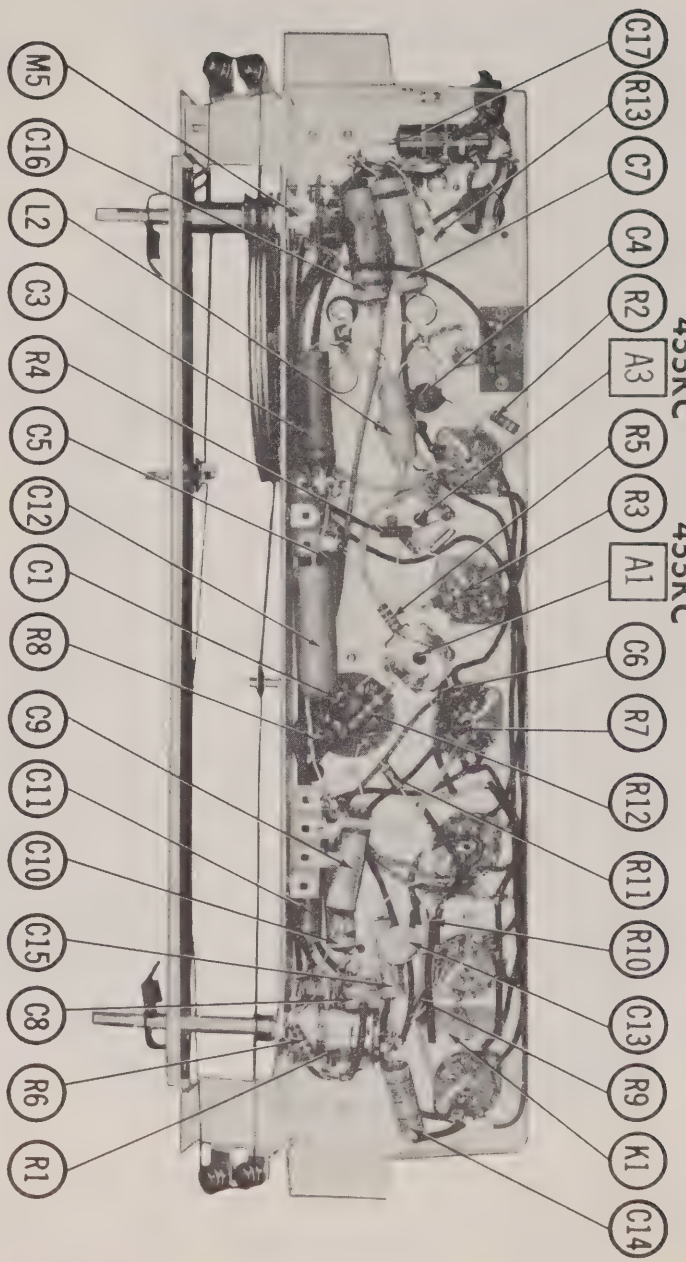
(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	SILVERTONE PART No.	JENSEN PART No.	WALCO PART No.	
M3	720055	† S-66 or †♦S-66SD or ♦ S-66D	† W-75TPS or †♦W-75DS or ♦ W-75TPD	† Jewel ♦ Diamond

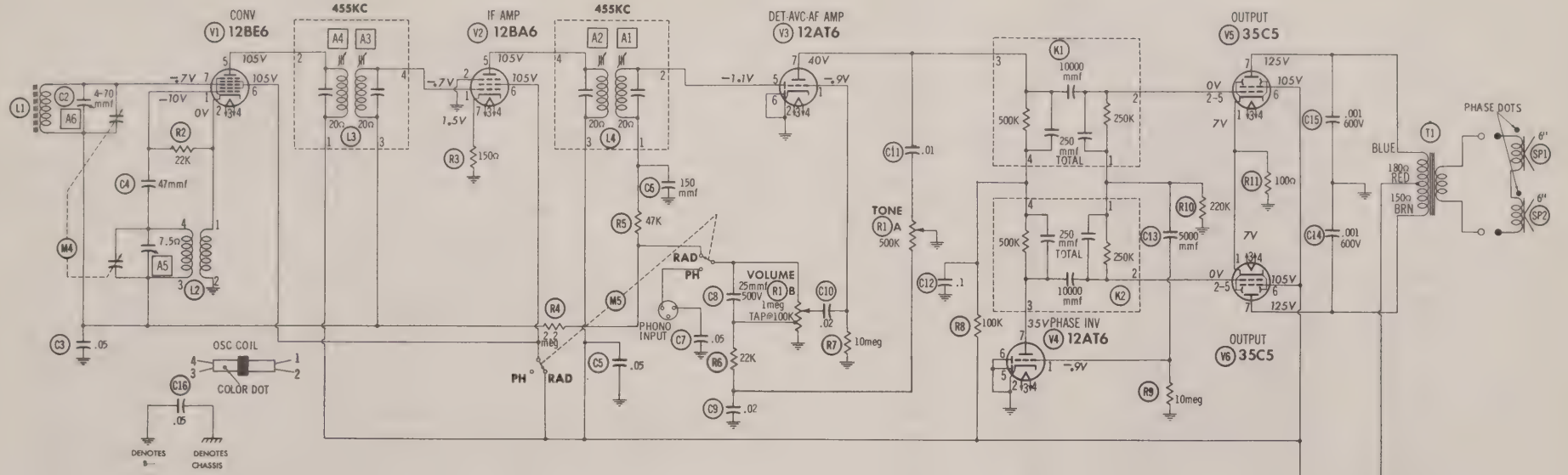
MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M4	Tuning Cap.	19-254	2 Gang (Ant. 12-465MMF, Osc. 32-200MMF)
M5	Switch	69-220	Radio-Phono (Rotary Wafer Type)
	Dial Pointer	54-41	
	Knob	310444	Tone, Tuning
	Knob	310443	On-Off & Radio-Phono

CHASSIS—BOTTOM VIEW



SILVERTONE MODEL 7053



DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

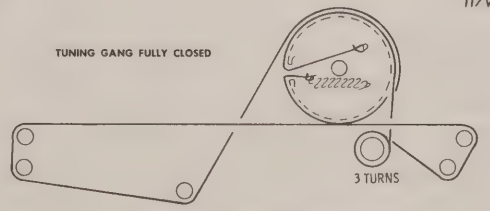
RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	22K	.7Ω	24Ω	36Ω	† 1200Ω	† 1200Ω	3.2Meg
V2	12BA6	3.2Meg	0Ω	36Ω	48Ω	† 1200Ω	† 1200Ω	150Ω
V3	12AT6	10Meg	0Ω	12Ω	0Ω	1Meg	0Ω	† 600K
V4	12AT6	10Meg	0Ω	12Ω	24Ω	0Ω	0Ω	† 600K
V5	35C5	100Ω	470K	48Ω	80Ω	NC	† 1200Ω	† 210Ω
V6	35C5	100Ω	470K	80Ω	115Ω	NC	† 1200Ω	† 180Ω

† MEASURED FROM OUTPUT OF M1

NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to commom negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

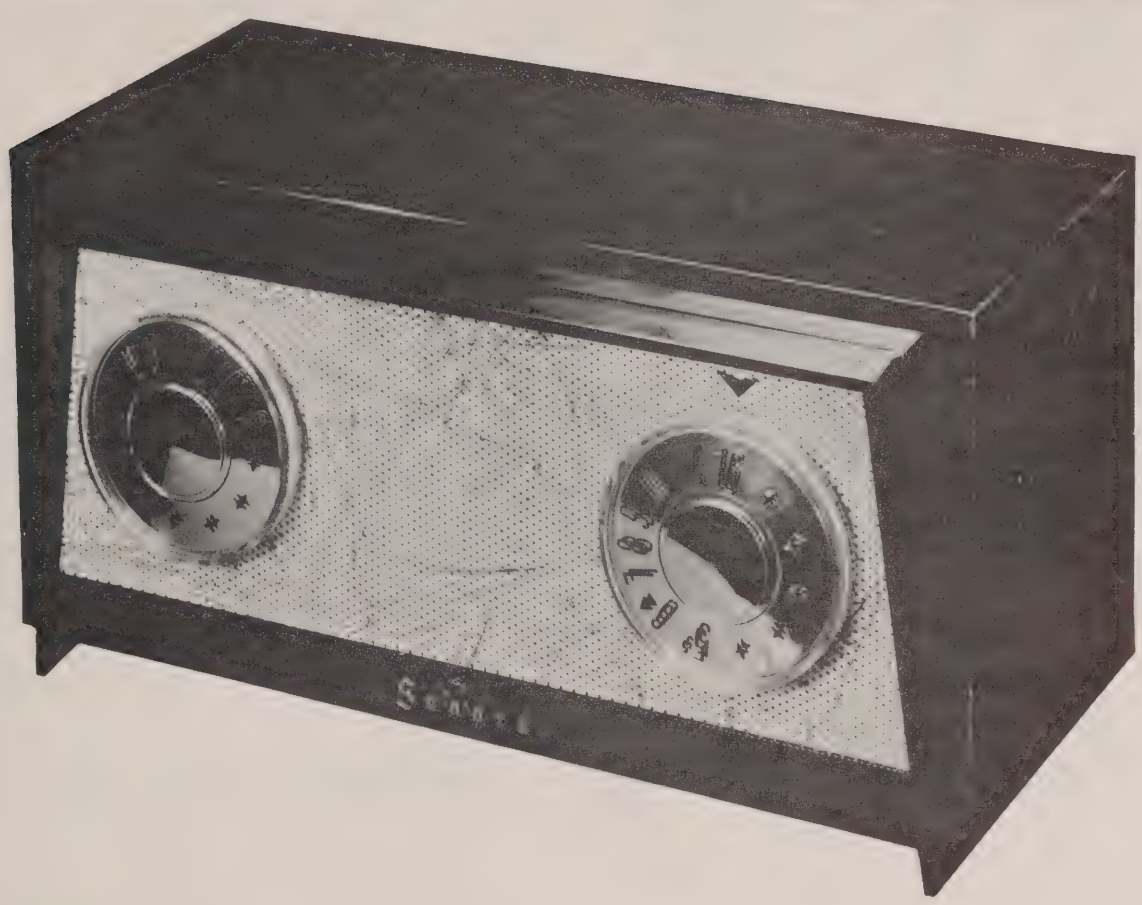


DIAL CORD STRINGING

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1957

SONORA
MODEL 617

SONORA
MODEL 617



SONORA
MODEL 617

TRADE NAME	Sonora Model 617
MANUFACTURER	Sonora Radio & Tel. Corp., 325 No. Hoyne Ave., Chicago, Ill.
TYPE SET	AC-DC Operated AM Receiver
TUBES (Four)	Types 12AU6 Converter, 12AV6 Det.-AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-DC
RATING	.27 Amp. @ 117 Volts AC (27 Watts)
TUNING RANGE—BROADCAST	535KC - 1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in the same relative position to chassis as when the receiver is in cabinet.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.05MFD	High side to Antenna Stator Lug on tuning gang. Low side to B-.	455KC (400~ Mod)	Tuning gang fully open	Across voice coil	A1, A2	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2		Loop	1620KC	"	"	A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3		"	1400KC	Tune to 1400KC signal	"	A4	"

PROPERTY OF
E. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

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PARTS LIST AND DESCRIPTIONS

SONORA MODEL 617

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	12AU6	
V2	Det. -AVC-AF Amp.	12AV6	
V3	Output	50C5	
V4	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	SONORA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	40	150		PRS150/ 25V4020/20	BBRT4215C	TCT3114	TDLT-12	FMT-321	R2455 *
B	20	150							
C	20	15							

* Non-Catalog Item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	SONORA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	100			SI 100	D6-101	L10T1	ED-100	UC-531	5GA-T1	
C3	56			NP0-SI 56	TCZ-56	C10Q56C	TCO-56			NP0 5%
C4	56			NP0-SI 56	TCZ-56	C10Q56C	TCO-56			NP0 5%
C5	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C6	.022	400		BPD-02	DD-203	CUB4S22	ED-02	GEM-4122	4TM-S22	
C7	.047	200		BPD-05	DF-503	CUB2S47		GEM-4147	2TM-S47	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SONORA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	2.5Meg	½	R2607	B-83	A47-2.5Meg-S	Q11-239	U255	Volume
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			KB-1	SWE-12	76-1	US-26	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

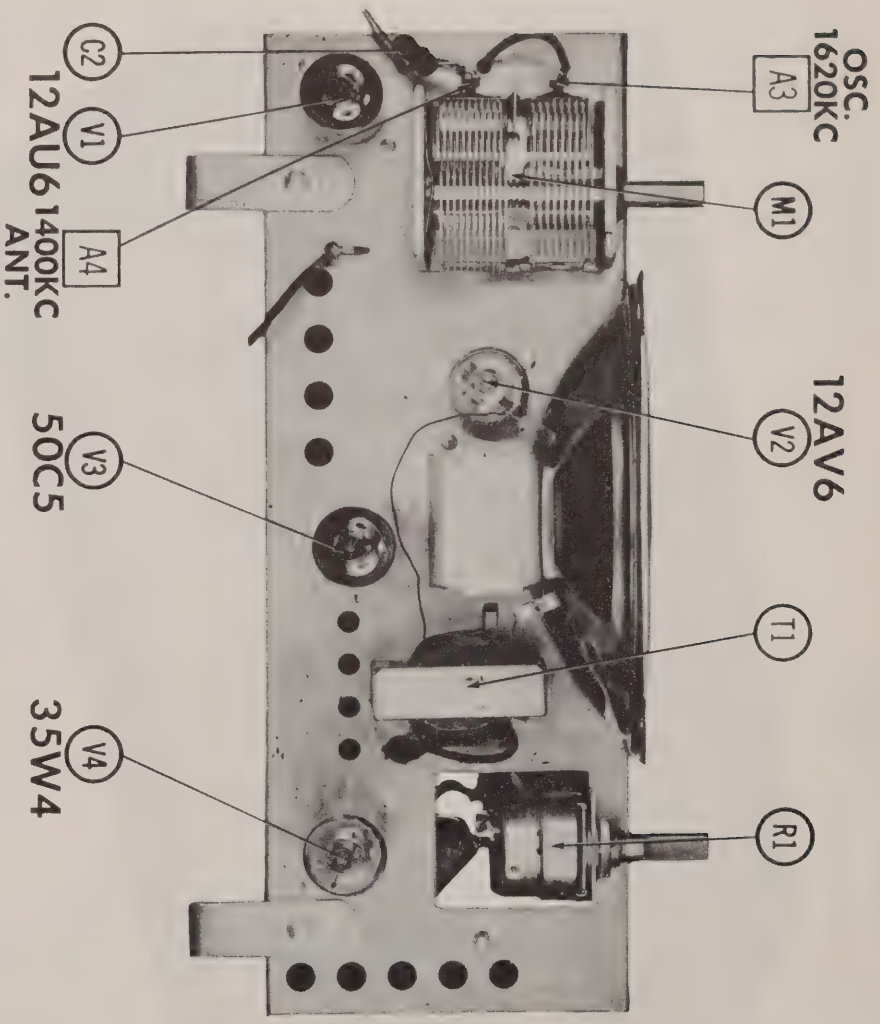
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SONORA PART No.	IRC PART No.	
R2	2.7Meg			BTS-2.7Meg	
R3	180Ω			BTS-180	
R4	2200Ω			BTS-2200	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SONORA PART No.	IRC PART No.	
R5	22Ω 5%			BTS-22 5%	
R6	68Ω				

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	SONORA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2700Ω	3-4Ω	R-2597	Z1101 ①	A-3025①	A-3332①	24S53	S-12X ①	① Bend ears down.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	SONORA PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	R-1478	4A07	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		SONORA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Stick					
L2	Osc. Coil					
L3	IF Coil Pri.					
L4	IF Coil Sec.					

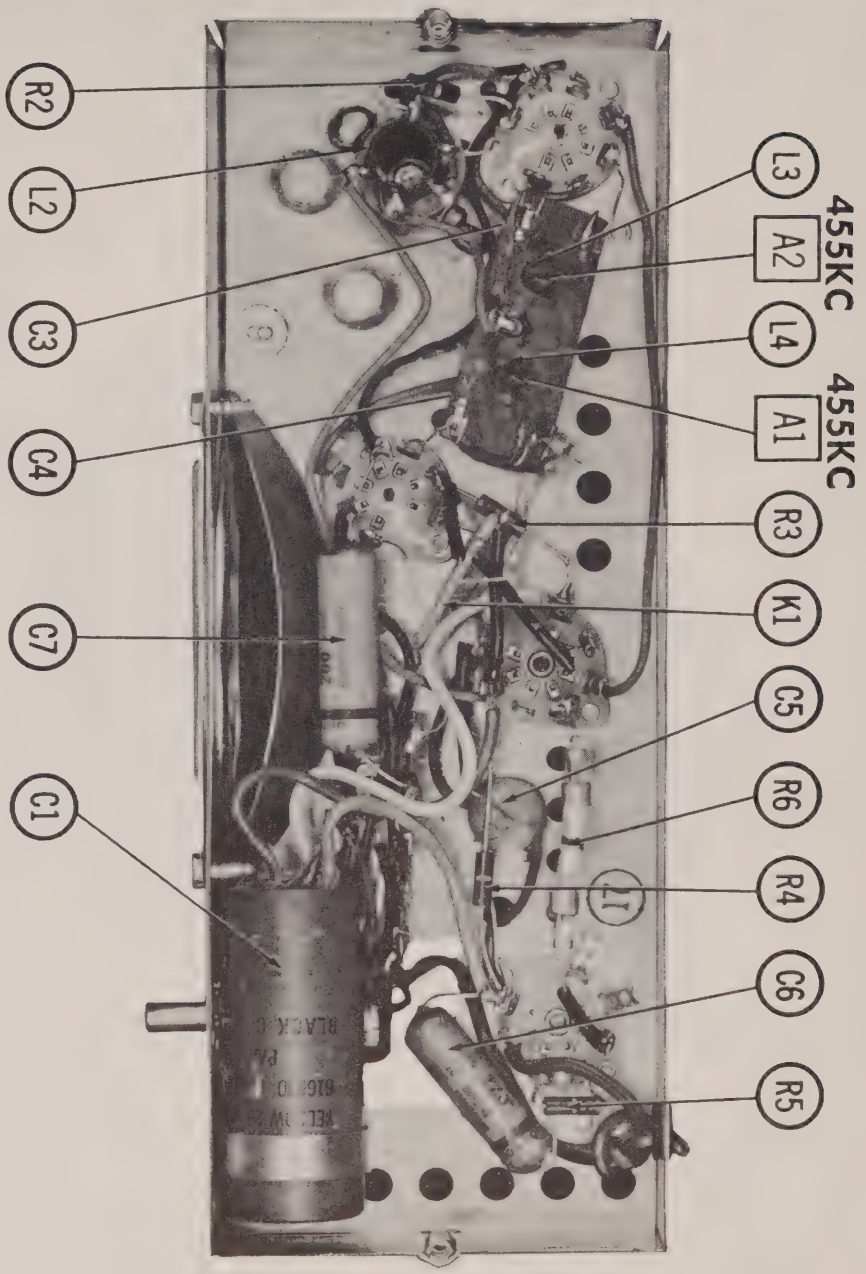
COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	SONORA PART No.	REPLACEMENT DATA	
K1	Det. -Audio Coup. Net.	2000MMF, 220MMF, 250MMF Total, 50000MMF 470K, 470K, 6.8Meg		Aerovox	PA-113-1
				Centralab	PC-150
				Cornell-Dubilier	116TM1
				Erie	1408-01
				Sprague	DT-4

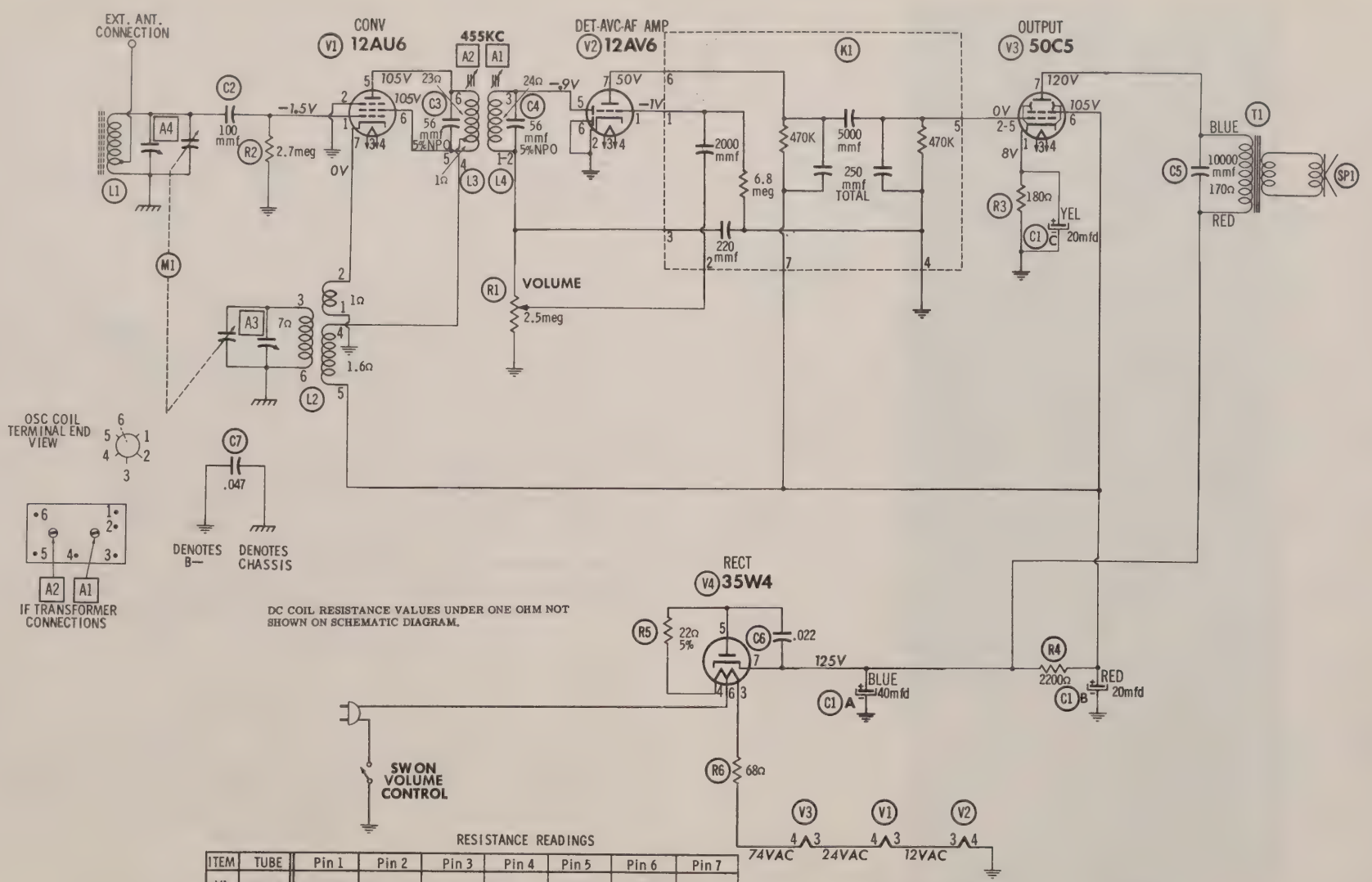
MISCELLANEOUS

ITEM No.	PART NAME	SONORA PART No.	NOTES
M1	Tuning Cap.	R-2608	2 Gang (Ant. 18-300MMF, Osc. 14-115MMF)

CHASSIS—BOTTOM VIEW



SONORA MODEL 617



DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12AU6	2.7Meg	0Ω	12Ω	24Ω	† 2200Ω	† 2200Ω	1Ω
V2	12AV6	6.8Meg	0Ω	12Ω	0Ω	2.5Meg	0Ω	† 470K
V3	50C5	180Ω	470K	24Ω	74Ω	470K	† 2200Ω	† 170Ω
V4	35W4	NC	NC	135Ω	175Ω	195Ω	150Ω	20K(Min)

† MEASURED FROM PIN 7 OF V4
NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to commom negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1957

PHOTOFACT* Folder

*TRADE MARK

SONORA
MODELS 664, 665, 666, 667

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MODEL 664

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER COLORADO

TRADE NAME	Sonora Models 664, 665, 666, 667
MANUFACTURER	Sonora Radio & Tel. Corp., 325 North Hoyne Ave., Chicago, Illinois
TYPE SET	Television Receiver
TUBES	Twelve
POWER SUPPLY	110-120 Volts AC, 60 Cycle RATING 110 Watts, 1 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, Video IF 41.25MC, Sound IF 45.75MC (Intercarrier)

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DATE 10 – 57 SET 374 FOLDER 12

SONORA
MODELS 664, 665, 666, 667

PHOTOFACT* Folder

SONORA
MODELS 664, 665, 666, 667

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 4 push-on type control knobs from the side.
2. Remove 3 metal screws and the rear cover.
3. Remove 4 metal screws securing the cabinet top.
4. Remove the built-in antenna leads and the cabinet top.
5. Remove grounding strap, picture tube socket, ion trap, yoke clamp and HV lead.
6. Remove 4 chassis bolts from the bottom.
7. Remove the chassis.

CAUTION NOTE

ONE SIDE OF AC LINE CONNECTED TO CHASSIS
Care should be exercised when connecting test equipment or physically contacting the chassis.

MODEL 664

SONORA
MODELS 664, 665, 666, 667

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF oscillator is possible by removing the channel selector and fine tuning knobs. Set the fine tuning at the center of its range. One slug for HIGH band adjustment is located at 1 o'clock, and should be adjusted first. The LOW band adjustment is located at 5 o'clock. Adjust for best picture and sound.

PICTURE TUBE SAFETY GLASS CLEANING

For picture tube and safety glass cleaning, it is necessary to remove the chassis. (See disassembly instructions).

FOCUS

Adjust the ion trap for the best focus consistent with maximum brightness.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

The horizontal frequency coil is used as the horizontal hold control. Adjust the horizontal hold until the picture synchronizes horizontally. (For location, see tube placement chart).

FUSES

A 5.6Ω fusible resistor (R61) is used for LV power supply protection. (For location, see tube placement chart).

CENTERING

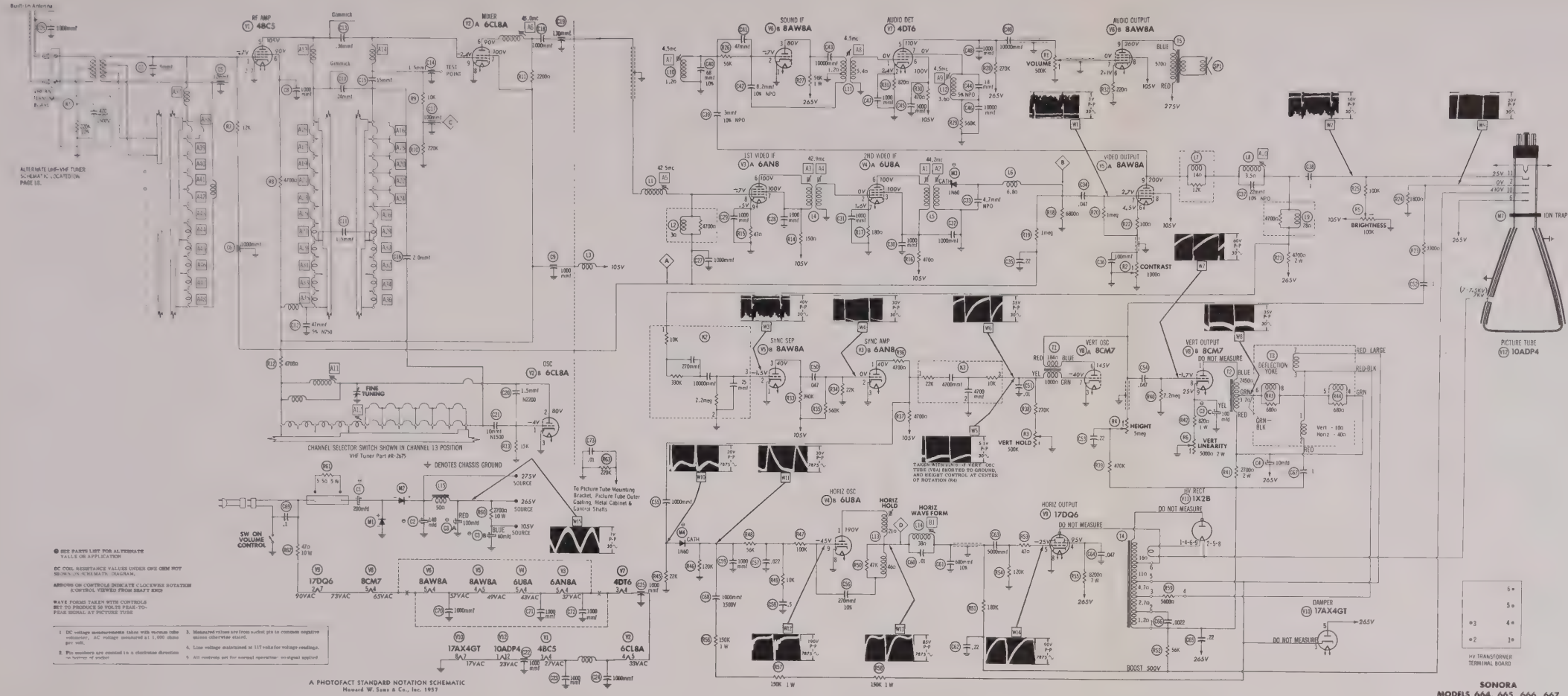
Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

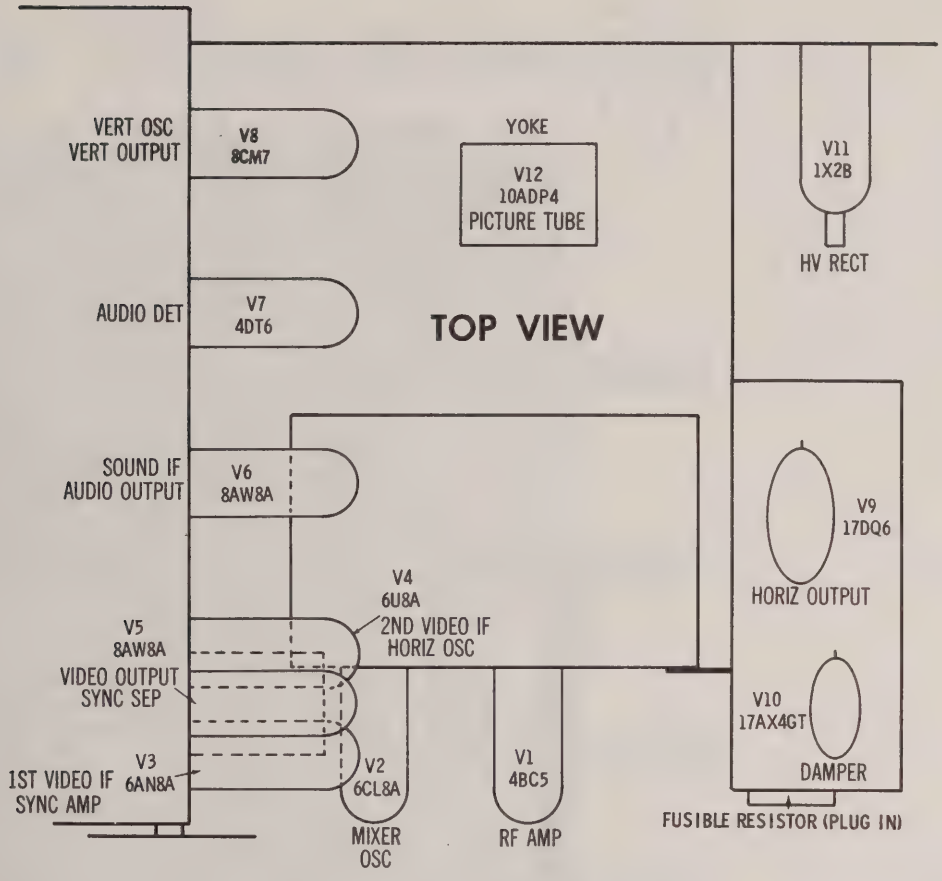
The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1957 Howard W. Sams & Co., Inc., Indianapolis 5, Indiana. Printed in U.S. of America

HI46

DATE 10-57 SET 374 FOLDER 12


Built-In Antenna
RF AMP V1 48C5
MIXER V2 A 6CL8A
SOUND IF V6 B 8AW8A
AUDIO DET V7 4DT6
AUDIO OUTPUT V6 B 8AW8A
VOLUME 500K
1ST VIDEO IF V3 A 6AN8
2ND VIDEO IF V4 A 6U8A
VIDEO OUTPUT V5 A 8AW8A
CONTRAST 1000Ω
BRIGHTNESS 100K
ION TRAP
PICTURE TUBE V12 10ADP4
ALTERNATE UHF-VHF TUNER SCHEMATIC LOCATION PAGE 18.
OSC V2 B 6CL8A
FINE TUNING
CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION
VHF Tuner Part #R-2675
DENOTES CHASSIS GROUND
SYNC SEP V6 B 8AW8A
SYNC AMP V3 B 6AN8
VERT OSC V1 A 8CM7
VERT OUTPUT V8 B 8CM7
DO NOT MEASURE
HEIGHT 5meg
VERT LINEARITY 5000Ω 2W
DEFLECTION YOKE
RED LARGE
RED-BLK
GRN-BLK
Vert - 10Ω
Horiz - 40Ω
HORIZ OSC V4 B 6U8A
HORIZ HOLD
HORIZ WAVEFORM
HORIZ OUTPUT V9 17DQ6
DO NOT MEASURE
HV RECT V11 1X2B
DAMPER V10 17AX4GT
DO NOT MEASURE
BOOST 500V
VERT HOLD 500K
TAKEN WITH 100Ω 2 WATT OSC TUBE (V8A) SHORTED TO GROUND, AND HEIGHT CONTROL AT CENTER OF ROTATION (R4)
To Picture Tube Mounting Bracket, Picture Tube Outer Coating, Metal Cabinet & Control Shafts
SW ON VOLUME CONTROL
17DQ6 8CM7 8AW8A 8AW8A 6U8A 6AN8A 4DT6
17AX4GT 10ADP4 4BC5 6CL8A
HV TRANSFORMER TERMINAL BOARD
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.
ARROWS OR CONTROLS INDICATE CLOCKWISE ROTATION CONTROL VIEWED FROM SHAFT END
WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE
1. DC voltage measurements taken with vacuum tube voltmeter, AC voltage measured at 1,000 ohms per volt.
2. Pin numbers are counted in a clockwise direction when looking at socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation and signal applied
A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1957
SONORA
MODELS 664, 665, 666, 667

TUBE PLACEMENT CHART



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TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

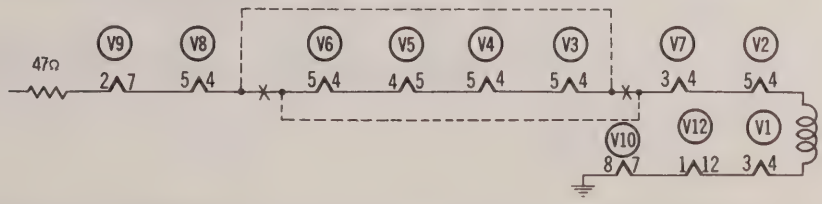
POWER SUPPLY FAILURE
No raster, no sound - Fusible Resistor (R61), Rectifier (M1, M2)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V3, V4, Diode (M3), V5
No pic, no sound, has snow - V1, V2
No pic, has sound, has raster - V5, V12
Has pic, no sound - V6, V7

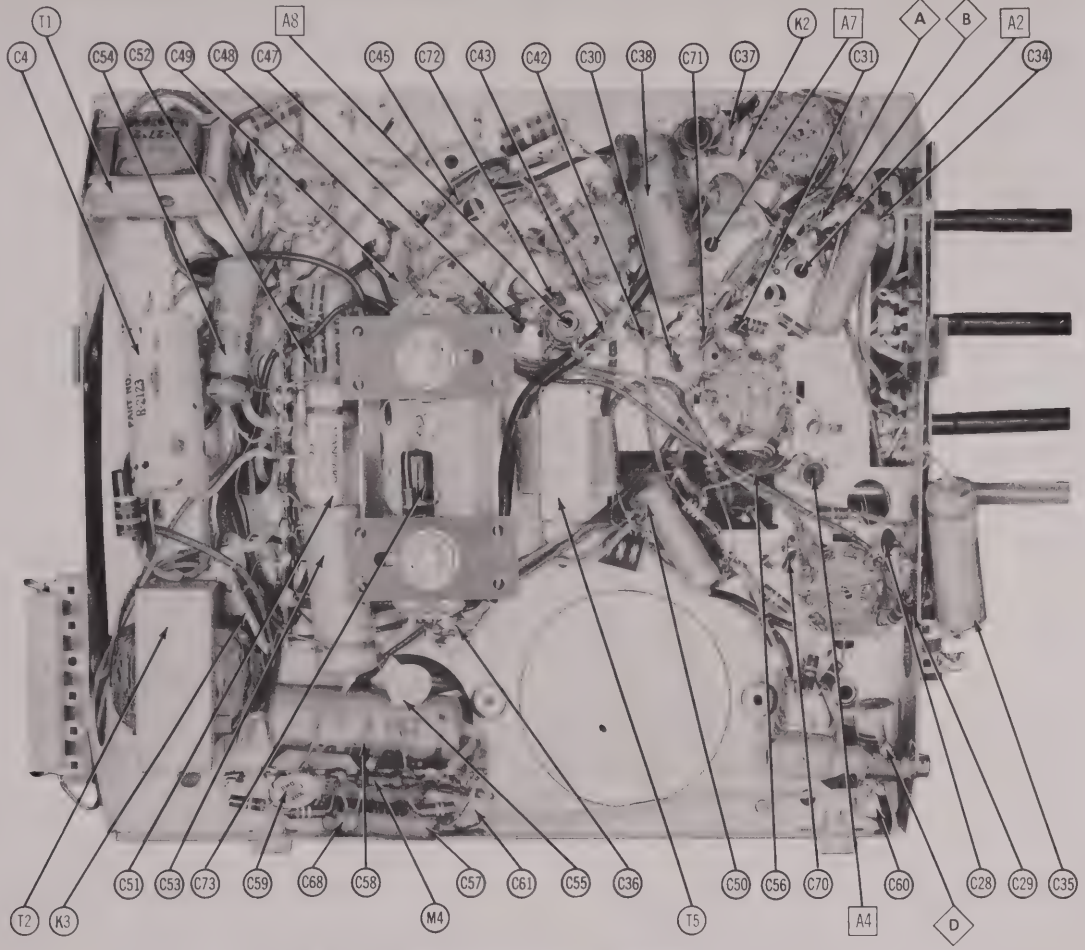
SYNC FAILURE
No vert. sync - V5, V3
No horiz. sync - V5, V3, Diode (M4)
No vert. or horiz. sync - V5, V3

SWEEP FAILURE
No raster, has sound - M4, V4, V9, V10, V11, V12
No vertical deflection - V8
Poor vert. linearity or foldover - V8
Poor horiz. linearity or foldover - V4, V9, V10
Narrow picture - V4, V9, V10, M1, M2
Vert. off freq. - V8
Horiz. off freq. - V4

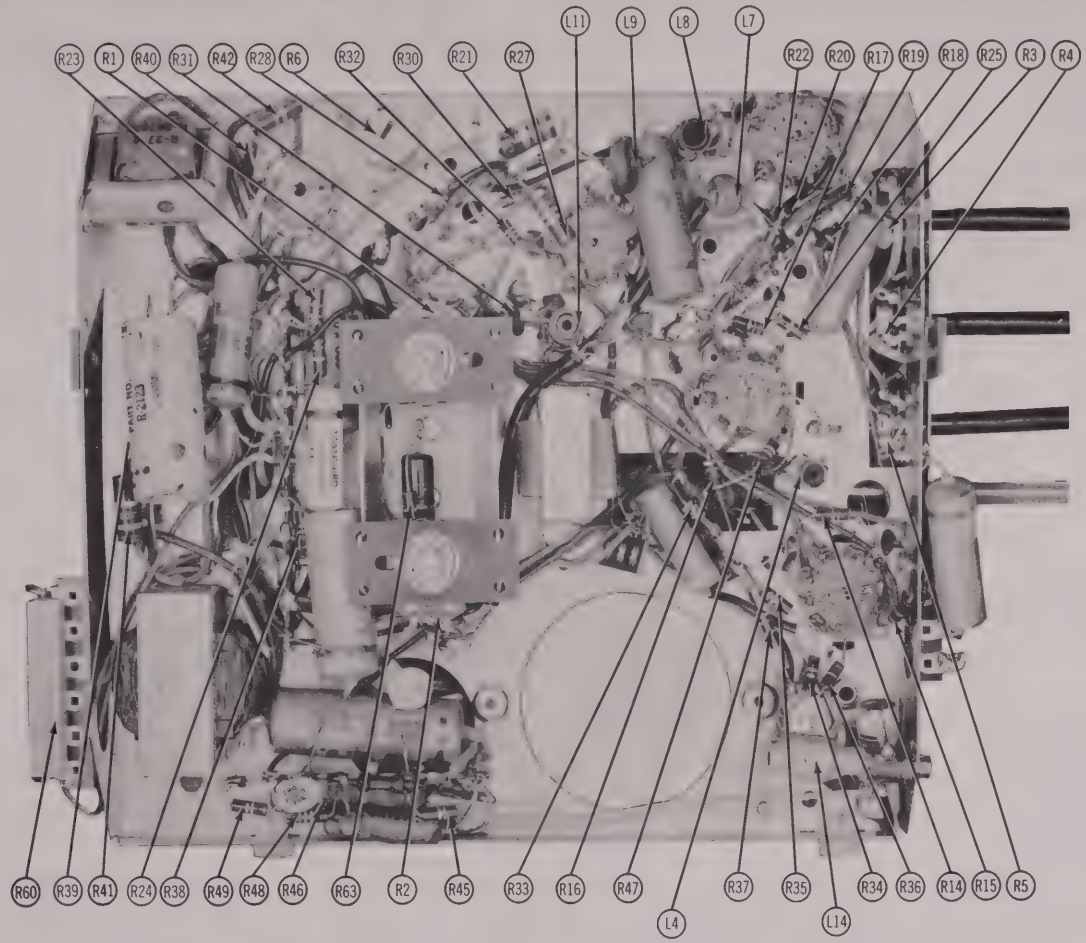
This receiver employs tubes used in a series filament network, an open filament in any tube in the series will cause the set to be inoperative. (See circuit below).



SET 374 FOLDER 12



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.
The high voltage lead should be securely taped and kept away from the chassis.

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt bias supply to point Ⓐ. Positive to chassis.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	Place a thin insulated metal strip between the mixer-oscillator tube (V2) and tube shield. Connect the high side of sweep generator to the metal strip. Low side to chassis.	Not used	44.2MC	Any non-interfering channel	USE VTVM. DC probe thru 10K to point Ⓑ. Common to chassis.	A1, A2	Adjust for maximum deflection with slugs farthest apart. Use only enough generator output to provide a usable indication on VTVM.
2.	"	"	"	42.9MC	"	"	A3, A4	"
3.	"	"	"	42.5MC	"	"	A5	Adjust for maximum deflection.
4.	"	"	"	45.0MC	"	"	A6	"
5.	"	"	45.0MC (10MC Swp)	41.25MC 42.6MC 45.75MC	"	High side thru 10K to point Ⓑ. Low side to chassis.		Check for response curve similar to Fig. 1 with markers as indicated. If necessary, SLIGHTLY retouch A1 thru A6 for desired response.

SOUND IF ALIGNMENT

Disconnect video coupling capacitor (C8) from the junction of resistor R18 and coil L6.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Direct	High side to loose end of C34 (See instructions above). Low side to chassis.	4.5MC (400KC Swp)	4.5MC	Any non-interfering channel	Across volume control (R1).	A7, A8	Preset A9 counter clockwise until it no longer effects response. Adjust A7 and A8 for maximum response and symmetry similar to Fig. 2. Use only enough sweep generator output to provide a usable pattern on scope.
7.	"	"	"	"	"	"	A9	Increase generator output to just below overload. Adjust for response similar to Fig. 3. with marker at zero reference as shown. Restore circuit to normal.

ALTERNATE SOUND IF ALIGNMENT USING ON THE AIR SIGNAL

Turn the set on and tune in a strong TV signal. Adjust A9 for maximum sound output.
Reduce the signal strength by using an attenuator or similar device until a hiss is heard in the sound. Adjust A7 and A8 for maximum undistorted sound. Increase the signal strength and retouch A9 for maximum undistorted sound.

4.5MC TRAP ALIGNMENT

Tune in a TV station and adjust the fine tuning until sound bars just appear in the picture.
Turn A10 fully counter clockwise, then clockwise until the horizontal scanning lines are smooth and continuous.

VHF OSCILLATOR ALIGNMENT

1. Turn the set on and tune in the highest high band (7-13) channel operating in the area.
2. Set the fine tuning to the center of its range.
3. Adjust A11 for best picture.
4. Turn channel selector to the highest low band channel operating in the area.
5. Adjust A12 for best picture.

VHF RF AND MIXER ALIGNMENT FOR TUNER #R-2675

Attempt this alignment only if the proper equipment is available.
Connect bias as under "Video IF Alignment".
Tube shields must be extended during alignment.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 10K to point Ⓒ. Low side to chassis.	A13, A14	Adjust for maximum gain and symmetry of response similar to Fig. 4. with markers as shown. Adjust by expanding or compressing coil turns.
9.	"	"	207MC (10MC Swp)	205.25MC 209.75MC	12	"	A15, A16	"
10.	"	"	201MC (10MC Swp)	199.25MC 203.75MC	11	"	A17, A18	"
11.	"	"	195MC (10MC Swp)	193.25MC 197.75MC	10	"	A19, A20	"
12.	"	"	189MC (10MC Swp)	187.25MC 191.75MC	9	"	A21, A22	"
13.	"	"	183MC (10MC Swp)	181.25MC 185.75MC	8	"	A23, A24	"
14.	"	"	177MC (10MC Swp)	175.25MC 179.75MC	7	"	A25, A26	"
15.	"	"	85MC (10MC Swp)	83.25MC 87.75MC	6	"	A27, A28	"
16.	"	"	79MC (10MC Swp)	77.25MC 81.75MC	5	"	A29, A30	"
17.	"	"	69MC (10MC Swp)	67.25MC 71.75MC	4	"	A31, A32	"
18.	"	"	63MC (10MC Swp)	61.25MC 65.75MC	3	"	A33, A34	"
19.	"	"	57MC (10MC Swp)	55.25MC 59.75MC	2	"	A35, A36	"

Be sure to adjust the antenna coils until gain is maximum at midband. Antenna adjustments (A37 thru A48) will lower or raise sound side of curve, but should always be aligned for maximum gain at center of bandpass. On low channels there will be a small hump between markers. This is the antenna gain and should be placed in center of bandpass.

ALIGNMENT INSTRUCTIONS (cont)

VHF RF AND MIXER ALIGNMENT FOR UHF-VHF TUNER

Connect the negative lead of 1.5 volt bias supply to point (A) . Positive to chassis.
Tube shields must be on tubes.
Attempt this alignment only if the proper test equipment is available.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
20.	Two 120Ω Carbon Resistors	Across VHF antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 10K to point (C). Low side to chassis.	A49, A50, A51, A52	Adjust for maximum gain and symmetry of response similar to Fig. 4 with markers as shown. The plate coil increments effect the sound side of the response curve. The mixer grid coil increments effect the picture side of curve and the antenna coil increments effect the gain at the center of the curve. If after alignment both markers fall either outside or inside of the peaks of the response curve, the width of the band-pass response can be altered by adjusting capacitor lead (A52) with respect to the ground lead of the capacitor. Closing the coupling will widen the response and vice versa.
21.	"	"	207MC (10MC Swp)	205.25MC 209.75MC	12	"	A53, A54, A55	Adjust for maximum gain and symmetry of response similar to Fig. 4 with markers as shown. Adjust in same order as bove. That is, adjust plate coil first, then mixer grid coil, then bringing response curve to maximum midband gain by adjusting the antenna coil increments.
			201MC (10MC Swp)	199.25MC 203.75MC	11		A56, A57 A58	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A59, A60, A61	
			187MC (10MC Swp)	187.25MC 191.75MC	9		A62, A63, A64	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A65, A66, A67	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A68, A69, A70	
22.	"	"	85MC (10MC Swp)	83.25MC 87.75MC	6	"	A71, A72 A73	The alignment of channels 6 thru 2 is accomplished in that order by adjusting the various coils for each channel. This time, however, the grid is adjusted first for the sound side of the curve, then the plate coil for the picture side and then the antenna coil for maximum midband gain. Do not move coils more than absolutely necessary to obtain desired response. Adjust for response similar to Fig. 5. The hump that appears between the markers represents the antenna response.
			79MC (10MC Swp)	77.25MC 81.75MC	5		A74, A75, A76	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A77, A78, A79	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A80, A81, A82	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A83, A84, A85	

UHF OSCILLATOR ALIGNMENT

Turn VHF tuner to UHF position.
1. Tune in a station on the highest channel available (about 870MC).
2. Adjust A86 for best picture.
3. Tune in a station on the lowest channel available (about 470MC).
4. Adjust A87 for best picture.

Do not attempt any other adjustments on this UHF tuner.

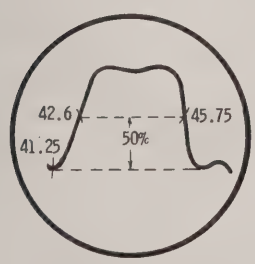


FIG.1

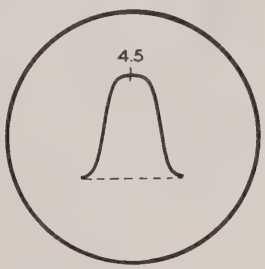


FIG.2

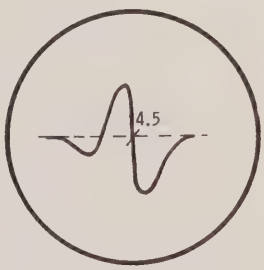


FIG. 3

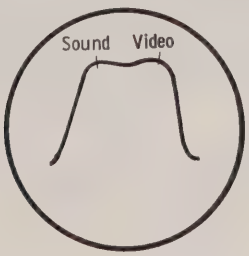


FIG. 4

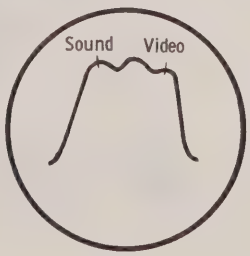
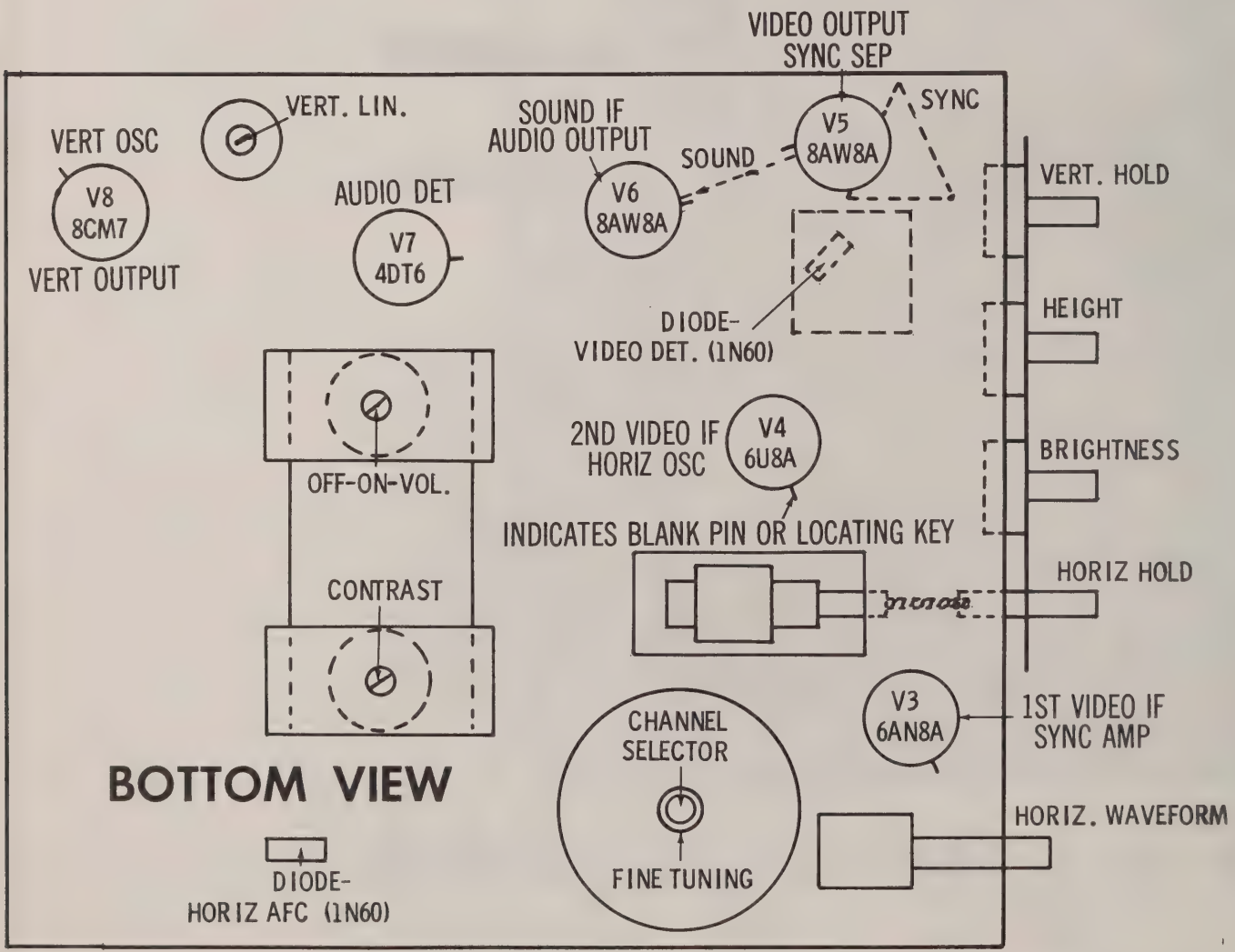


FIG. 5

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	4BC5	1Meg	0Ω	6Ω	7Ω	† 2700Ω	† 7500Ω	0Ω		
V2	6CL8A	15K	† 7500Ω	0Ω	7Ω	9Ω	† 5000Ω	2700Ω	0Ω	230K
V3	6AN8A	† 12K	18K	0Ω	12Ω	14Ω	† 2900Ω	† 2900Ω	1Meg	47Ω
V4	6U8A	‡235K	.1Ω	† 4200Ω	14Ω	16Ω	† 4200Ω	180Ω	0Ω	275K
V5	8AW8A	0Ω	2.2Meg	† 390K	19Ω	16Ω	● 230Ω	1Meg	† 2700Ω	† 4800Ω
V6	8AW8A	0Ω	56K	† 56K	19Ω	22Ω	220Ω	0Ω	† 2700Ω	† 570Ω
V7	4DT6	5.4Ω	820Ω	12Ω	9Ω	† 270K	† 3200Ω	560K		
V8	8CM7	‡5200Ω	NC	0Ω	22Ω	25Ω	● ‡400K	● 300K	2.2Meg	● 2400Ω
V9	17DQ6	NC	32Ω	NC	† 8200Ω	120K	TP	25Ω	0Ω	TOP CAP † 11Ω
V10	17AX4GT	NC	NC	¶	NC	† 50Ω	NC	4.5Ω	0Ω	
V11	1X2B	PINS 1 THRU 9 HAVE INFINITE RESISTANCE								TOP CAP ‡27Ω
V12	10ADP4	4.5Ω	1800Ω	PIN 6 † 50Ω	PIN 10 ‡56K	PIN 11 ● 120K	PIN 12 6Ω			

† MEASURED FROM OUTPUT OF M2.
‡ MEASURED FROM PIN 3 OF V10.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
¶ THIS READING CAN VARY GREATLY, (10K MINIMUM), DUE TO THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
NC NO CONNECTION
TP TIE POINT



TUBE PLACEMENT CHART

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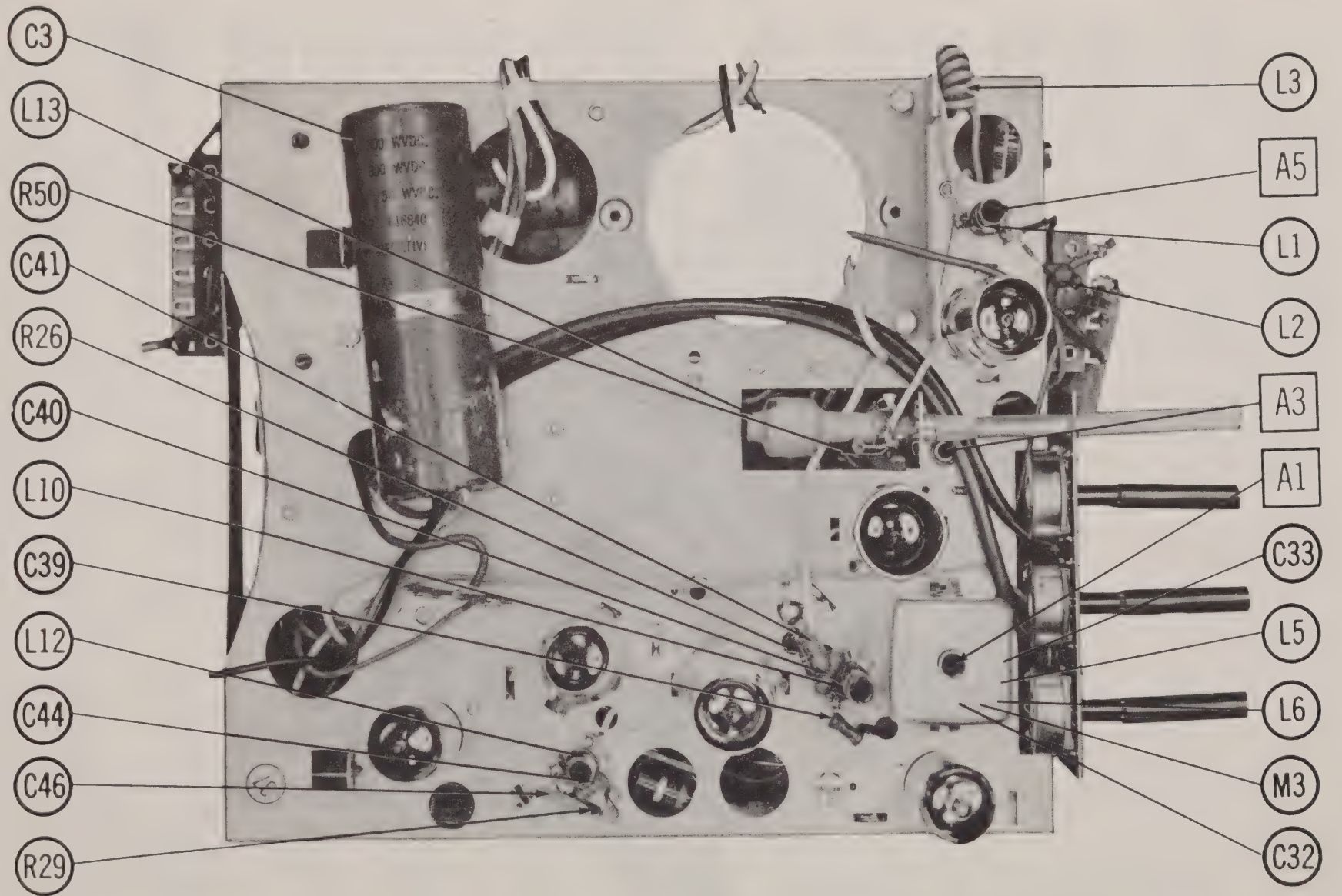
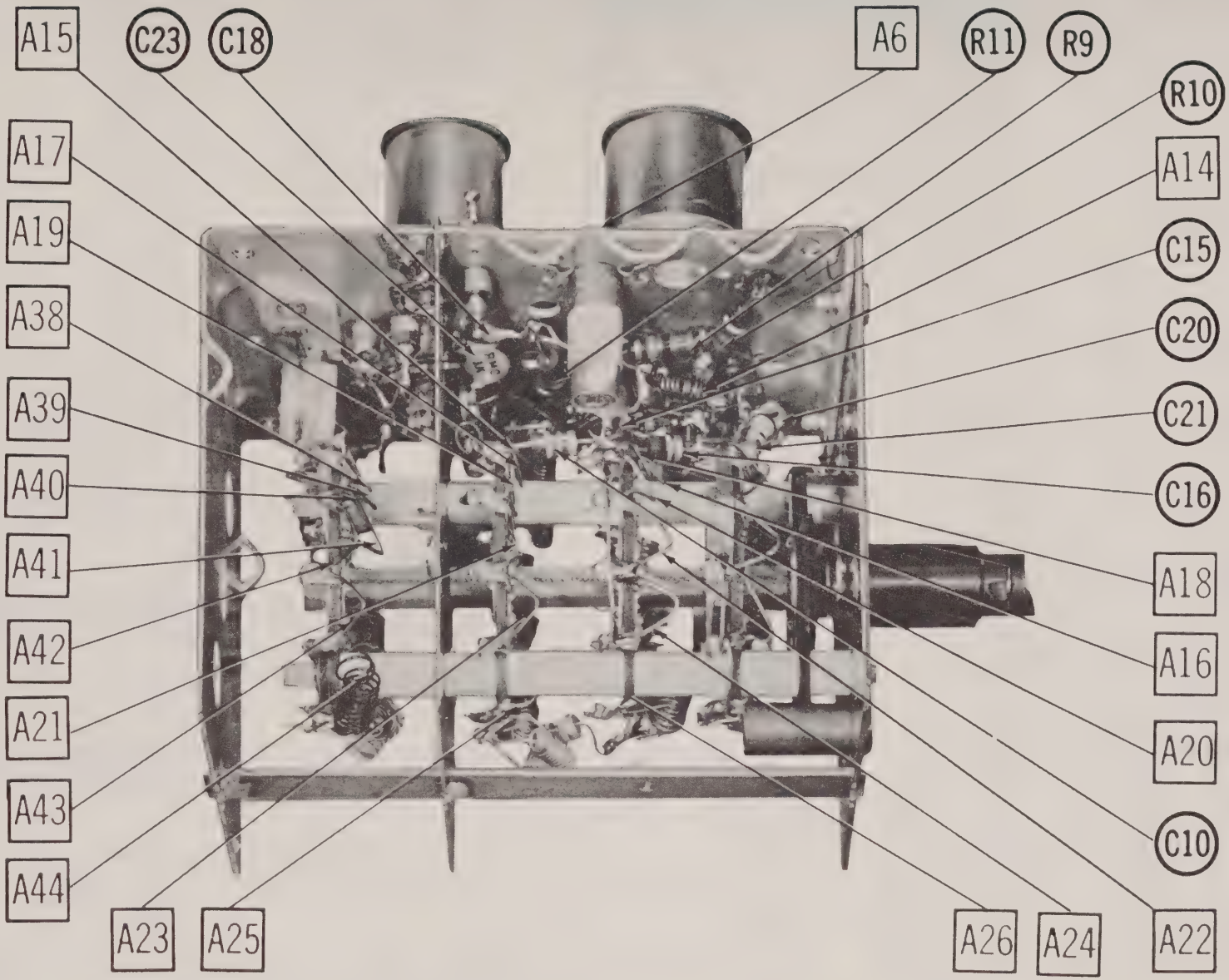
CHASSIS TOP VIEW

SONORA MODELS 664, 665, 666, 667



CHASSIS-TOP VIEW



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RF TUNER-LEFT SIDE

SONORA MODELS 664, 665, 666, 667

SET 374 FOLDER 12

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	R.F Amplifier	6BC5	
V2	Mixer Oscillator	6CL6A	
V3	1st. Video IF Amp. - Sync Amp	6AN8A	
V4	2nd Video IF Amp - Horiz Osc	6U8A	
V5	Video Output - Sync Sep.	6AW8A	
V6	Sound IF Amp - Audio Output	6AW8A	
V7	Audio Detector	6DT6	
V8	Vert Osc - Vert. Output	6CM7	
V9	Horiz. Output	17GP4	
V10	Damper	17AX4GT	
V11	HV Rectifier	1B3B	

PICTURE TUBE

ITEM No.	REPLACEMENT DATA			NOTES
	SONORA PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	
V12	21ABP4			

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP	VOLT	SONORA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	300	150	K-2696	PRS150V300	BR30065	WS342	TD-300-150	S-110	TVA-1423
C2	160	300	K-2695	PRS-100	BBR10X314	WR437	TMD-34	S-300	
C3 A	100	100	R-2697	PRS-047		WT430		S-225	
B	60	300						MTD-4530	
C	100	50							
C4	10	200	R-2123	PRS350V10	BR1045	TC62	TD-10-450	MT- 4810	TVA-1904

Alternate part number R-2138
Alternate part number R-2122
Alternate part number R-2127

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP	VOLT	SONORA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C5	12									
C6	1000			EF-001	MFT-1000				503C-DL	
C7	5			BP-001	DD-050	L10V5	ED-5	2T-555	5GA-V5	
C8	1000			BPD-001	DD-102	BYA501	ED-1000	DCS2	5HK-DL	
C9	1000			EF-001	MFT-1000				503C-DL	
C10	24									
C11	1.5			NP0-SI 1.5	TCZ-1R5	C10V15C	TCO-1.5	2T-5815	5TCCD-V15	
C12	47			N750-DL 47	TCM-47	C10Q47U	TCT-47	NT-5447	5TCU-Q47	N750 5%
C13	36									
C14	1.5									
C15	15			BPD-000015	DD-150	L10Q15	HD-15	UC-5415	5GA-Q15	
C16	2.0					C10V2C				
C17	100									
C18	1000			BPD-001	DD-102	BYA501	ED-1000	DCS2	5HK-DL	
C19	130									
C20	1.5									N2200
C21	10									N1500
C22	1000			EF-001	MFT-1000				503C-DL	
C23	1000			BPD-001	DD-102	BYA501	ED-1000	DCS2	5HK-DL	
C24	1000			BPD-001	DD-103	BYA502	ED-1000	DCS2	5HK-DL	
C25	1000			EF-001	MFT-1000				503C-DL	
C26	1000			BPD-001	DD-103	BYA501	ED-1000	DCS2	5HK-DL	
C27	1000		R-1447	BPD-001	DD-102	BYA501	ED-1000	DCS2	5HK-DL	
C28	1000		R-1447	BPD-001	DD-103	BYA501	ED-1000	DCS2	5HK-DL	
C29	1000		R-1447	BPD-001	DD-103	BYA501	ED-1000	DCS2	5HK-DL	
C30	1000		R-1447	BPD-001	DD-103	BYA501	ED-1000	DCS2	5HK-DL	
C31	1000		R-1447	BPD-001	DD-103	BYA501	ED-1000	DCS2	5HK-DL	
C32	1000		R-1447	BPD-001	DD-103	BYA501	ED-1000	DCS2	5HK-DL	
C33	4.7		R-1447	NP0-SI 4.7	TCZ-4R7	C20V47C	TCO-4.7	2T-5547	5TCCD-V47	NP0
C34	047	300	R-1482	BPD-05	DF-503	CUBD347		GRM-4147	5TM-S47	
C35	33	300	R-1485	P388N-33		CUBSP33		GEM-3032	2TM-P33	
C36	100		R-5033	SI 100	DS-101	L15T1	GP-100	UC-531	5GA-T1	
C37	22		N-9049	NP0-SI 22	TCZ-22	CTAD222C	TCO-22		5TCC-Q22	NP0 10%
C38	1	400	N-4123	P488N-1	DF-104	CUBAP1		GEM-401	4TM-P1	
C39	3		N-1104	NP0-SI 3.0			TCO-3	2T-563	5TCC-Q30	NP0 10%
C40	68		N-7944	NP0-SI 68	DS-680	L20Q68	ED-68		5TCC-Q68	10%
C41	47		R-1445	SI 47	DS-470	L20Q47	ED-47	UC-5447	5GA-Q47	
C42	8.2		R-1441	NP0-SI 8.2	TCZ-8R2		TCO-8.2			NP0 10%
C43	10000		N-9052	BPD-01	DD-103	BYA501	ED-D	DCS1	5HK-S1	
C44	18		R-2177		TCZ-18	CTAC18C	TCO-18			NP0 5%
C45	5000		N-5272	BPD-006	DD-502	BYAU05	ED-005	DCS25	5HK-D5	
C46	10000		N-9052	BPD-01	DD-103	BYA501	ED-01	DCS1	5HK-S1	
C47	1000		R-1447	BPD-001	DD-103	BYA501	ED-1000	DCS2	5HK-DL	
C48	1000		R-1447	BPD-001	DD-103	BYA501	ED-1000	DCS2	5HK-DL	
C49	10000		N-9052	BPD-01	DD-103	BYA501	ED-01	DCS1	5HK-S1	
C50	047	300	R-1482	BPD-05	DF-503	CUBD347		GEM-4147	5TM-S47	
C51	01	600	R-1450	BPD-01	DD-103	CUBS01	ED-01	GEM-511	5TM-S1	
C52	1	600	N-7798	P488N-1	DF-104	CUBAP1		GEM-401	4TM-P1	
C53	22	400	R-1466	P488N-22		CUBAP22		GEM-4033	4TM-P22	
C54	047	400	R-1453	BPD-05	DF-503	CUBD347		GEM-4147	5TM-S47	
C55	1000		R-1447	BPD-001	DD-103	BYA501	ED-1000	DCS2	5HK-DL	
C56	270		R-1439	1488-00027		SRST27			MS-327	10%
C57	022	600	R-1451	BPD-03	DD-303	CUBD322		GEM-4123	5TM-S22	
C58	5	300	N-8696	P388N-5		CUBSP5		GEM-305	2TM-P5	
C59	1000		R-1447	BPD-001	DD-103	BYA501	ED-1000	DCS2	5HK-DL	
C60	01	600	R-1450	BPD-01	DD-103	CUBS01	GP-10000	GEM-511	5TM-S1	
C61	680		R-2142	1484-00068		SRST68			MS-268	10%
C62	22	600	R-2150	P488N-22		CUBAP22		GEM-5033	5TM-P22	
C63	5000		N-5272	BPD-006	DD-502	BYAU06	ED-005	DCS25	5HK-D5	
C64	047	400	R-1453	BPD-05	DF-503	CUBD347		GEM-4147	5TM-S47	
C65	22	600	R-2158	P488N-22		CUBAP22		GEM-5033	5TM-P22	
C66	0022	600	R-2201	BPD-0022	DK-222	CUBD222	GP-2200	GEM-6222	5TM-D22	
C67	1	300	N-1252	P288N-1	DF-104	CUBP1		GEM-201	2TM-P1	
C68	1000	1500	R-1449	HVD-15-1000	DCS0-102	HVB15K1	HDK5-1000	DCS021	20CA-D1	
C69	1	400	R-2577	P488N-1	DF-104	CUBAP1		GEM-401	4TM-P1	
C70	1000		R-1447	BPD-001	DD-102	BYA501	ED-1000	DCS2	5HK-DL	
C71	1000		R-1447	BPD-001	DD-102	BYA501	ED-1000	DCS2	5HK-DL	
C72	1000		R-1447	BPD-001	DD-103	BYA501	ED-1000	DCS2	5HK-DL	
C73	01	600	N-9439	BPD-01	DD-103	CUBS01	GP-10000	GEM-511	5TM-S1	

CONTROLS

ITEM No	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESIST ANCE	WATTS	SONORA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500 K	1	R-2706	AB-50	A47-500K-2	CJ3-133	U48	Volume
B	Shaft			AK-7	FS-3	Not Req.	Not Req.	
C	Switch			KB-1	SWS-13	76-1	U8-26	
R2A	1000Ω	1	R-2707	AB-508		CJ7-108	U3	Contrast
B	Shaft			AK-7		Not Req.	Not Req.	
R3A	500 K	1	R-2705	AB-50	A47-500K-8	CJ1-133	PT-A85L	Vert. Hold
B	Shaft			AK-19	RN-3	TQ	Not Req.	
R4A	5Meg	1	R-2704	AB-87	A47-5Meg-8	CJ1-141	TA-85L	Height
B	Shaft			AK-19	RN-3	TQ	Not Req.	
R5A	100 K	1	R-2708	AB-40	A47-100K-8	CJ1-138	PT-A85L	Brightness
B	Shaft			AK-19	RN-3	TQ	Not Req.	
R6	50000	2	R-2046		2B-5000			Vert Lin. - wire wound

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SONORA PART No.	IRC PART No.	
R7	12K			BTS-12K	
R8	4700Ω			BTS-4700	
R9	10K			BTS-10K	
R10	220K			BTS-220K	
R11	2200Ω			BTS-2200	
R12	4700Ω			BTS-4700	
R13	15K			BTS-15K	
R14	150Ω		N-1350	BTS-150	
R15	47Ω		N-4227	BTS-47	
R16	470Ω		N-501	BTS-470	
R17	180Ω		N-4047	BTS-180	
R18	6800Ω		N-4680	BTS-6800	
R19	1Meg		N-1263	BTS-1Meg	
R20	1Meg		N-1263	BTS-1Meg	
R21	4700Ω	2	N-7018	BTS-4700	
R22	100Ω		N-1315	BTS-100	
R23	3300Ω		N-8718	BTS-3300	
R24	1000Ω		N-4281	BTS-1000	
R25	100K		N-1719	BTS-100K	
R26	56 K		N-4233	BTS-56K	
R27	56K	1	N-7254	BTA-56K	
R28	270K		N-7004	BTS-270K	
R29	560K		N-7790	BTS-560K	
R30	470Ω		N-501	BTS-470	
R31	820Ω		N-4319	BTS-820	
R32	330Ω		N-4054	BTS-330	
R33	390K		N-3038	BTS-390K	
R34	22K		N-4013	BTS-22K	
R35	560K		N-7780	BTS-560K	

ITEM No	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SONORA PART No.	IRC PART No.	
R36	47000		N-4278	BTS-4700	
R37	47000		N-4278	BTS-4700	
R38	270K		N-7004	BTS-270K	
R39	470K		N-4027	BTS-470K	
R40	2.2Meg		N-4277	BTS-2 2Meg	
R41	2700Ω	2	N-7126	BTS-2700	
R42	82Ω	1	N-9016	BTA-820	
R43	680Ω		N-1684		
R44	680Ω		N-1454		
R45	22K		N-8013		
R46	180K		N-3009		
R47	100K		N-2973		
R48	56K		N-4232		
R49	10K		N-4295		
R50	47K		N-7134		
R51	180K		N-7033	BTS-180K	
R52	56K		N-4233	BTS-56K	
R53	47Ω		N-7787	BTS-47	
R54	130K		N-3009	BTS-130K	
R55	8500Ω	T	N-2769	PWG-8500	
R56	150K	1	N-9017	BTA-150K	
R57	150K	1	N-9017	BTA-150K	
R58	150K	1	N-9017	BTA-150K	
R59	56000		N-7400		
R60	27000	10	N-8134		
R61	5.5Ω	5	R-1409	FRS. 6	
R62	47Ω	10	R-3699		
R63	220K		N-4026	BTS-220K	

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA								NOTES
		SONORA PART No.	Halldorson PART No.	Merit PART No.	RCA TYPE No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	Vert. Osc	R-2713	B6703 ①	A-3003 ①	209T1 ①	V405 ①	A-8125 ①	26A03 ①	A-97X ①	
T2	Vert. Output	R-2700								
T3A	Yoke-Horiz (23MH)	R-2666								
B	(800)-Vert. (11.4MH)						DY-25A ②			
T4	Horiz. Output	R-2654								

① Drill new mounting hole(s).
② Use original rear cover and centering device. Use original damping network, if necessary.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	SONORA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T5	15K	3-4Ω	R-2711	Z1118 ①	A-3990	A-88H ①	24H54 ①	S-61X ①	① Drill one new mounting hole.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	SONORA PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	R-2703	4AD8	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		SONORA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	1st. Video IF	R-3063			TV-131	6238
L3	RF Choke	R-1431			19-5033 *	25 Microhenries, wound on 4700Ω resistor
L9	B+ Choke	R-1670	19-1001		BC-563	4604
L4	2nd. Video IF	R-3701	17-6525		TV-130	6249
L5	3rd. Video IF	R-3066	17-6534		TV-130	6249
L6	Series Peaking Coil	R-1470	19-3093		TV-1H	6177
L7	Series Peaking Coil	R-1950			TV-130 a	6233 a 68 Microhenries
L8	4.5MC Trap	N-8021	20-1004		TV-1H	1670 336 Microhenries, wound on 12K resistor
L9	Shunt Peaking Coil	R-1949	19-5100 +			1240 Microhenries, wound on 4700Ω resistor
L10	1st. Sound IF	R-1626	17-3400		TV-1H	1468
L11	Snd. Sound IF	R-2150				
L12	Quadrature Coil	R-2156	20-1006		TV-1H	1480

* Parallel with 4700Ω resistor. a Parallel with 12K resistor. + Parallel with 10K resistor

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.		REPLACEMENT DATA							NOTES
	PRI.	SEC.	SONORA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Ram PART No.	Thordarson PART No.	
L13	67Ω *		R-1406		TV-165				HS-7	10-67 5 Millihenries Horiz. Freq.
L14	38Ω		R-1405		TV-166 a				HS-8	8-15 5 Millihenries Horiz. Waveform

* Tapped @ 46Ω a Enlarge mounting hole.

FILTER CHOKE

ITEM No	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D.C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ~)	SONORA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L15	170A	50Ω	9H HY.	R-3056	C-5041 ①	C-2996 ①	C-2328 ①	26C44 ①	C-34X

① Drill one new mounting hole.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	SONORA PART No.	REPLACEMENT DATA	
K1	Ant. Isolation	470MMF @ 1600V, 230K 10%			
K2	Sync Complete	270MMF, 10000MMF, 253MMF, 10K, 330K, 1.2Meg	R-3689	Centralab Sprague	PC-380 HT-1
K3	Vert. Integrator	470MMF, 4700MMF, 22K, 10K	R-3688	Centralab	PC-106

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA							NOTES
	CURRENT (Measured)	SONORA PART No.	FEDERAL PART No.	GENERAL ELECTRIC PART No.	INTERNATIONAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.		
M1	.170A	R-2147	1G28A ①	1N005 ①	6RS250 ①	6S250	250A ½		
M2	.170A	R-2147	1G28A ①	1N005 ②	6RS250 ②	6S250	250A ½		

① Selenium type. ② Germanium type.

CRYSTAL DIODES

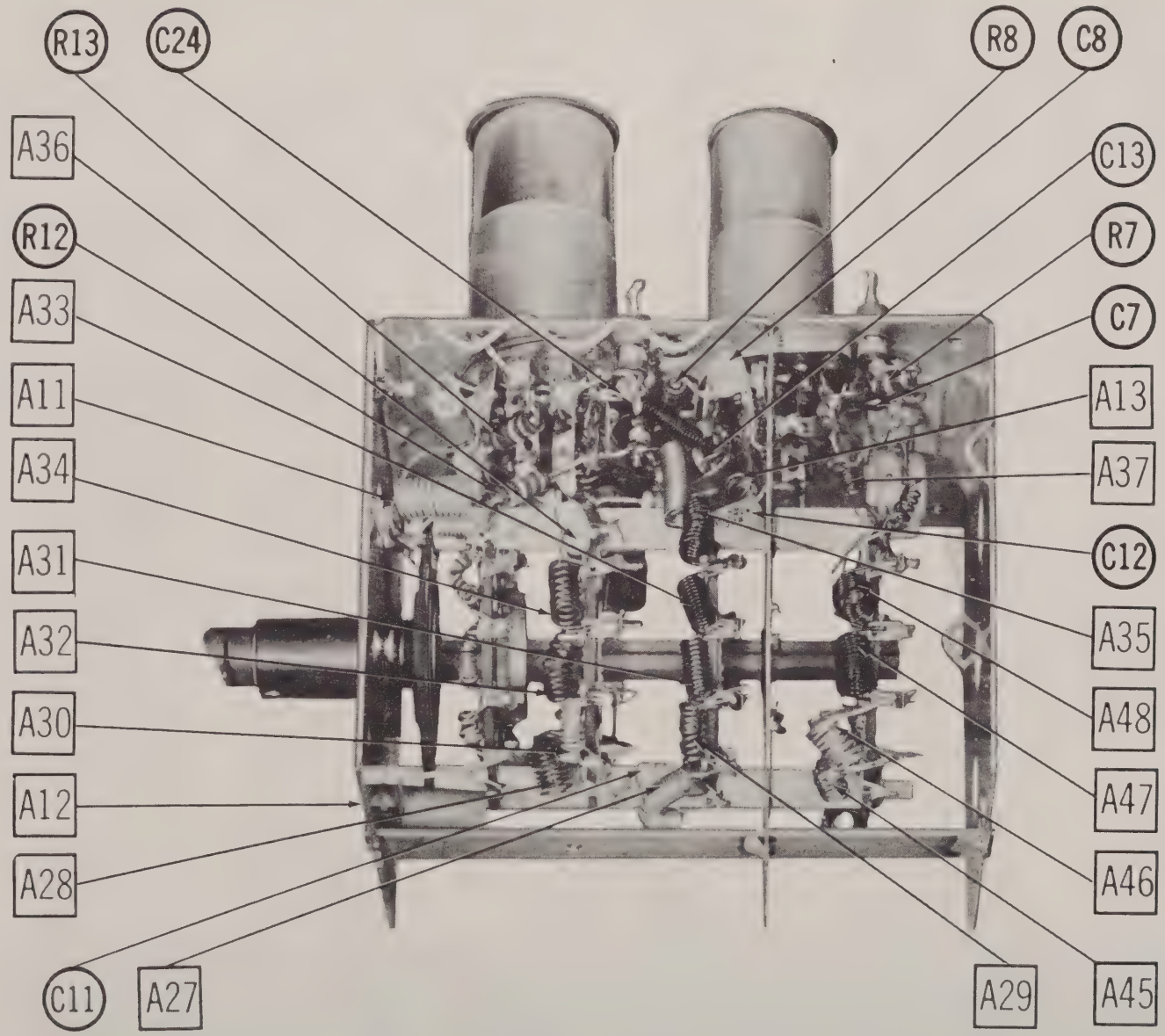
ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		SONORA PART No.	CBS PART No.	SYLVANIA PART No.	
M3	*1N80		1N80	1N80	Video Det. (Pigtail)
M4	†1N80		1N80	1N80	Horiz. AFC (Pigtail)

* A 1N54 may be used in some versions.
† A selenium diode (Part #R-2141) may be used in some versions.

MISCELLANEOUS

ITEM No.	PART NAME	SONORA PART No.	NOTES
M5	Tuner	R-3675	VHF (Sarkes Tarzian #'T-34)
	Tuner		UHF-VHF (Sarkes Tarzian #U-17V15A)
M6	Centering Device	R-2687	Includes yoke rear cover
M7	Ion Trap	R-3044	

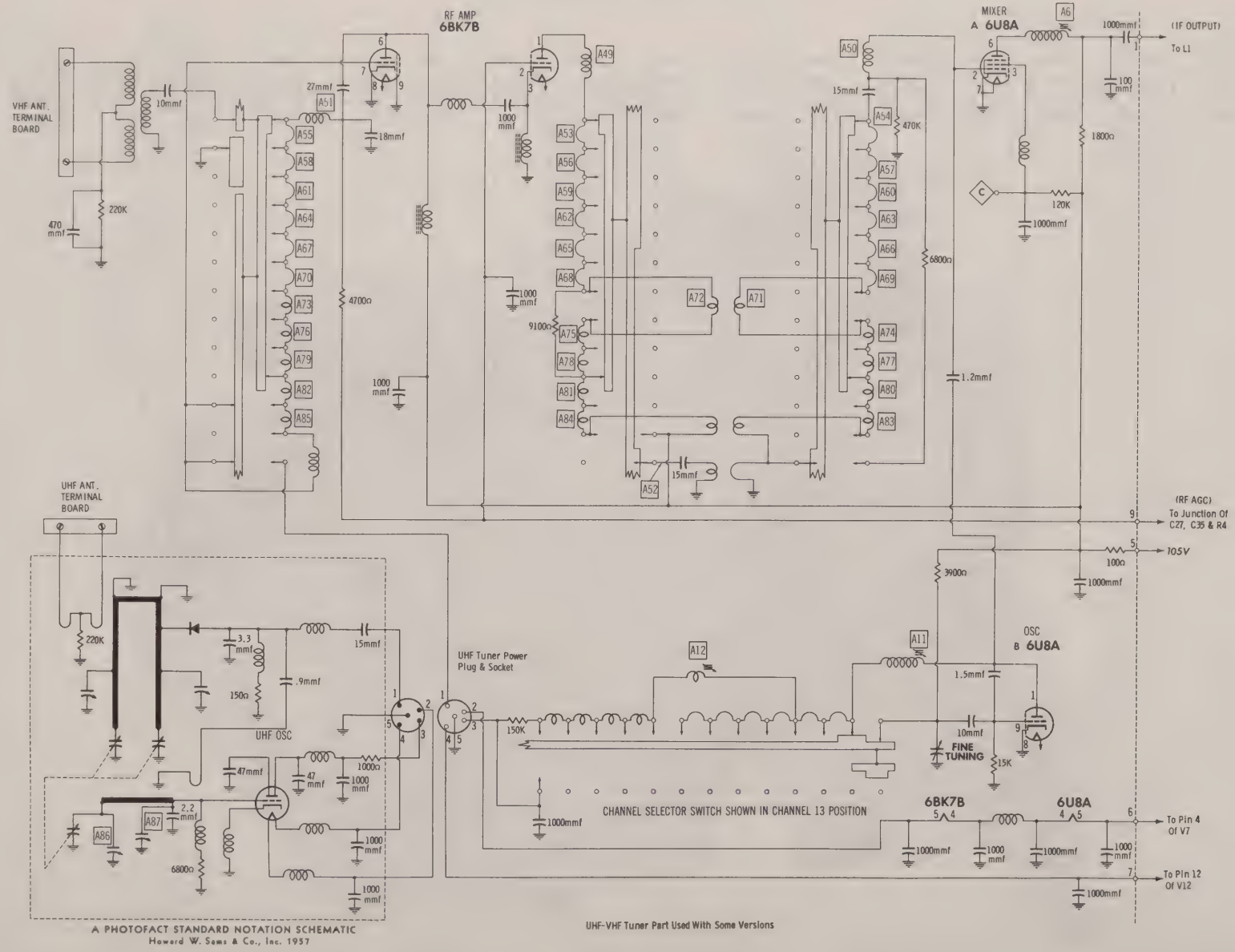
SONORA MODELS 664, 665, 666, 667



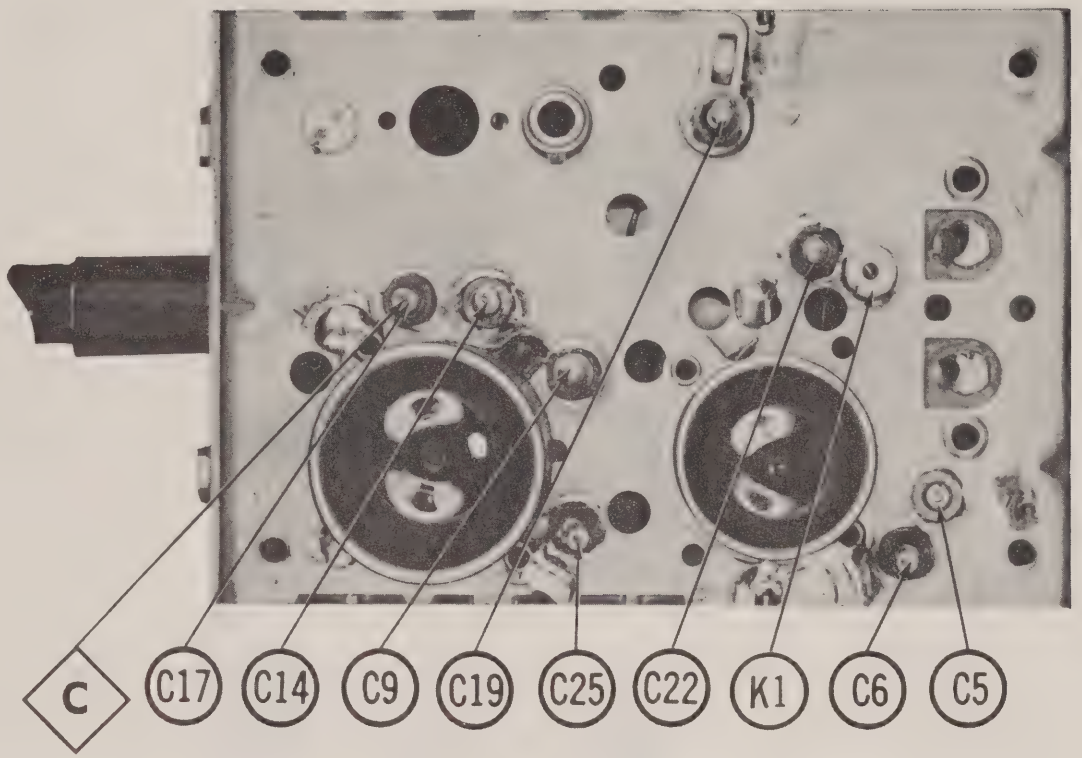
RF TUNER-RIGHT SIDE

CHASSIS-BOTTOM VIEW

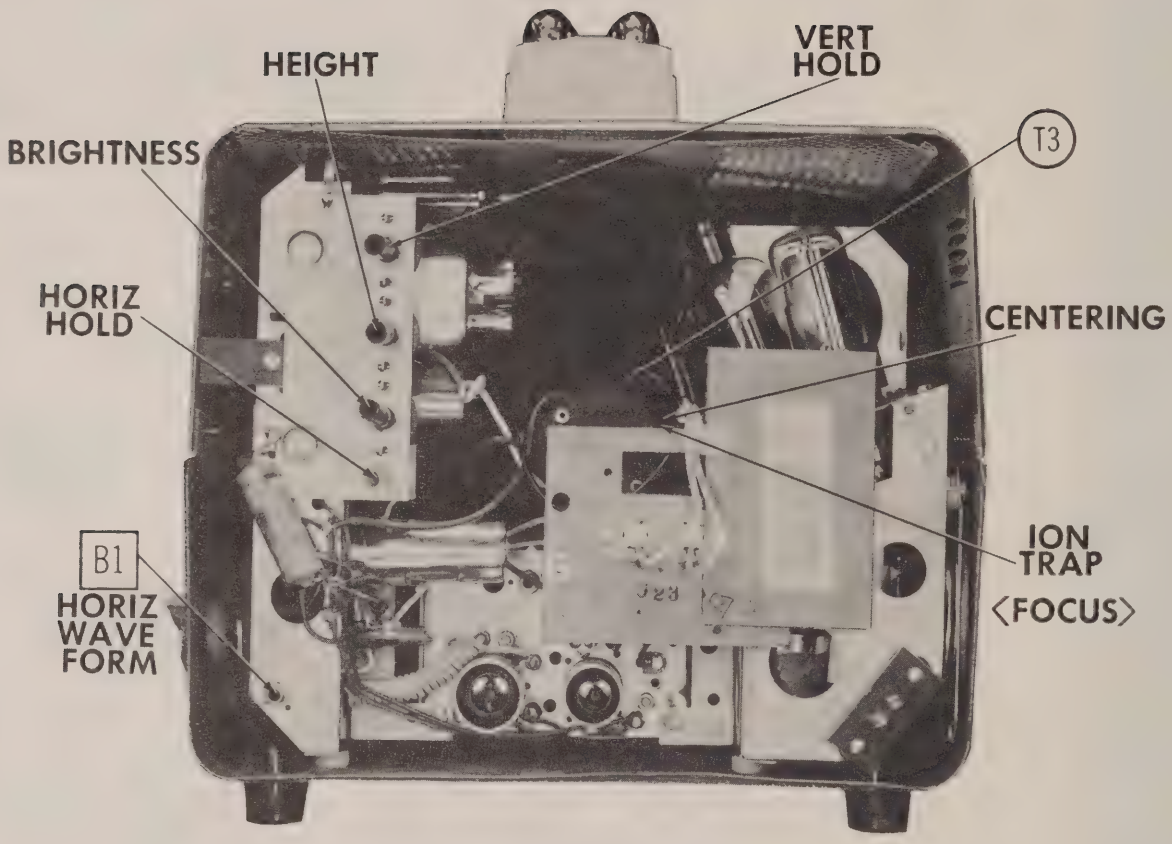
SONORA MODELS 664, 665, 666, 667



ALTERNATE TUNER SCHEMATIC



RF TUNER-TOP VIEW



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern.

Adjust horizontal hold until the picture synchronizes horizontally.

Connect the vertical amplifier of the scope thru a low capacity probe to point ◇D◇. Adjust waveform slug (B1) to obtain response curve similar to Fig. 6 with sharp and broad peaks of equal amplitude. Keep picture in sync during this adjustment with B1.

Check sync pull-in by switching off channel and back again. Retouch horizontal hold if necessary for proper operation.

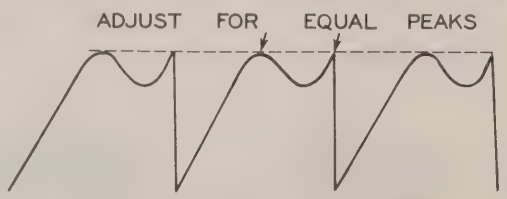
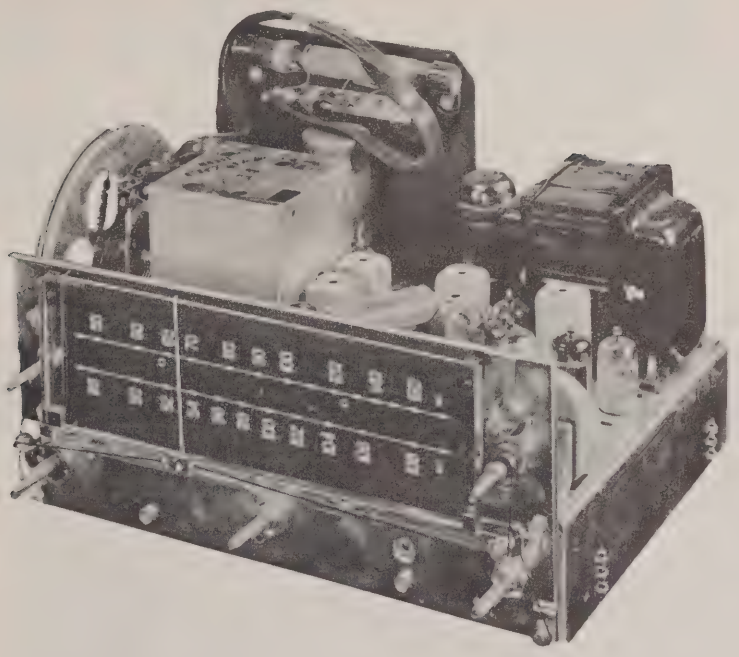


FIG. 6

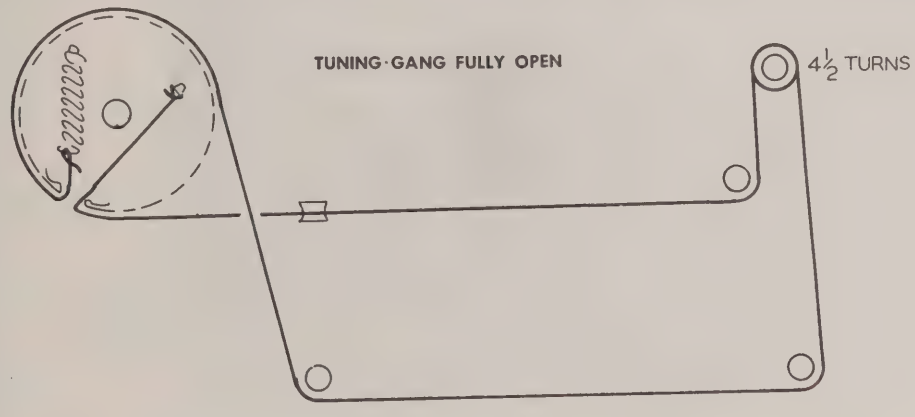


PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

SPARTAN
CHASSIS CR-741

SPARTAN
CHASSIS CR-741

TRADE NAME	Spartan Chassis CR-741AA		
MANUFACTURER	Spartan Div., The Magnavox Co., 2131 Bueter Road, Fort Wayne 4, Ind.		
TYPE SET	AC Operated FM-AM Receiver		
TUBES	Ten		
POWER SUPPLY	110-120 Volts AC-60 Cycles	RATING	.375 Amp. @ 117 Volts AC
TUNING RANGE - BROADCAST	540KC-1620KC	FREQ. MOD.	88MC-108MC



DIAL CORD STRINGING

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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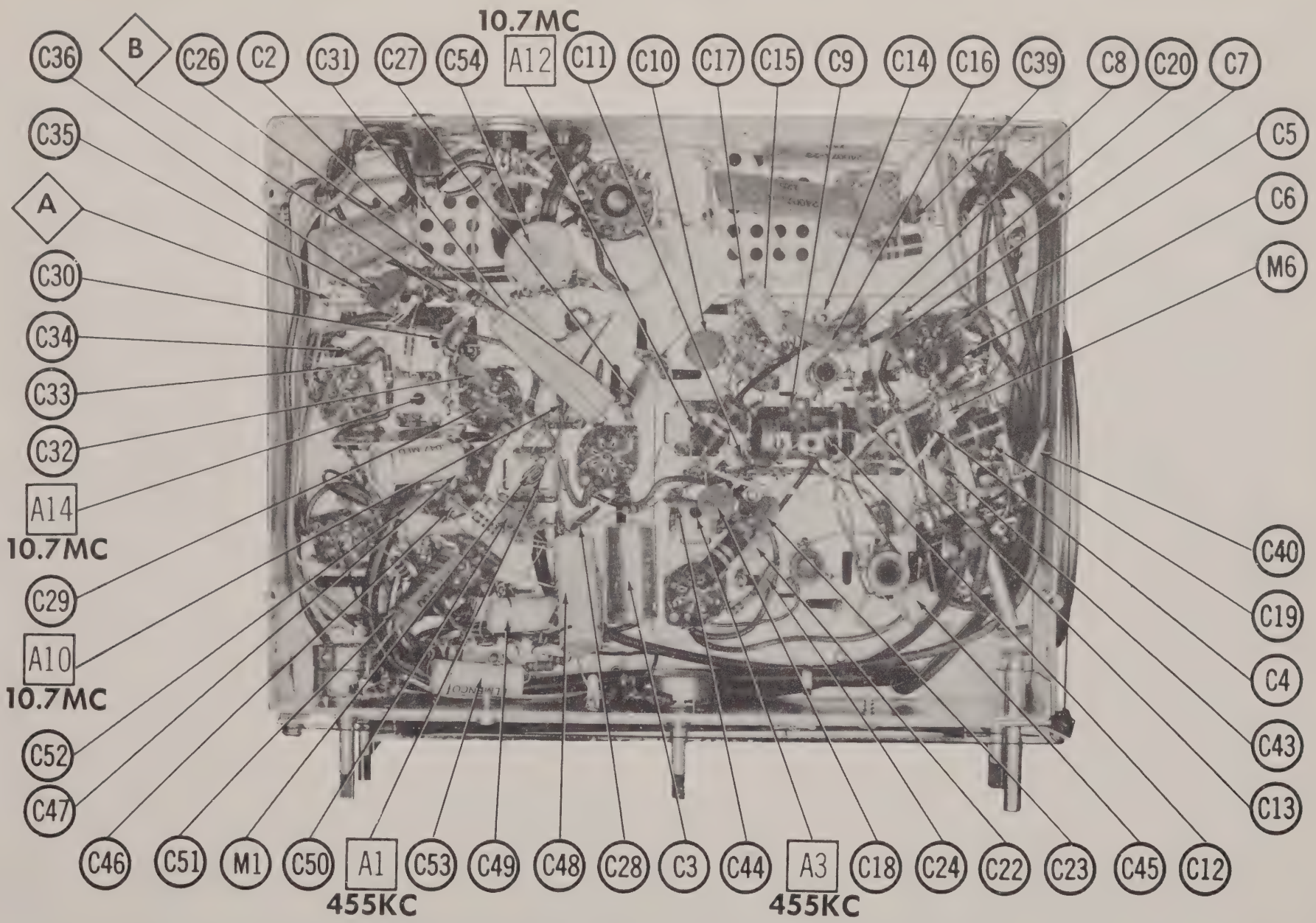
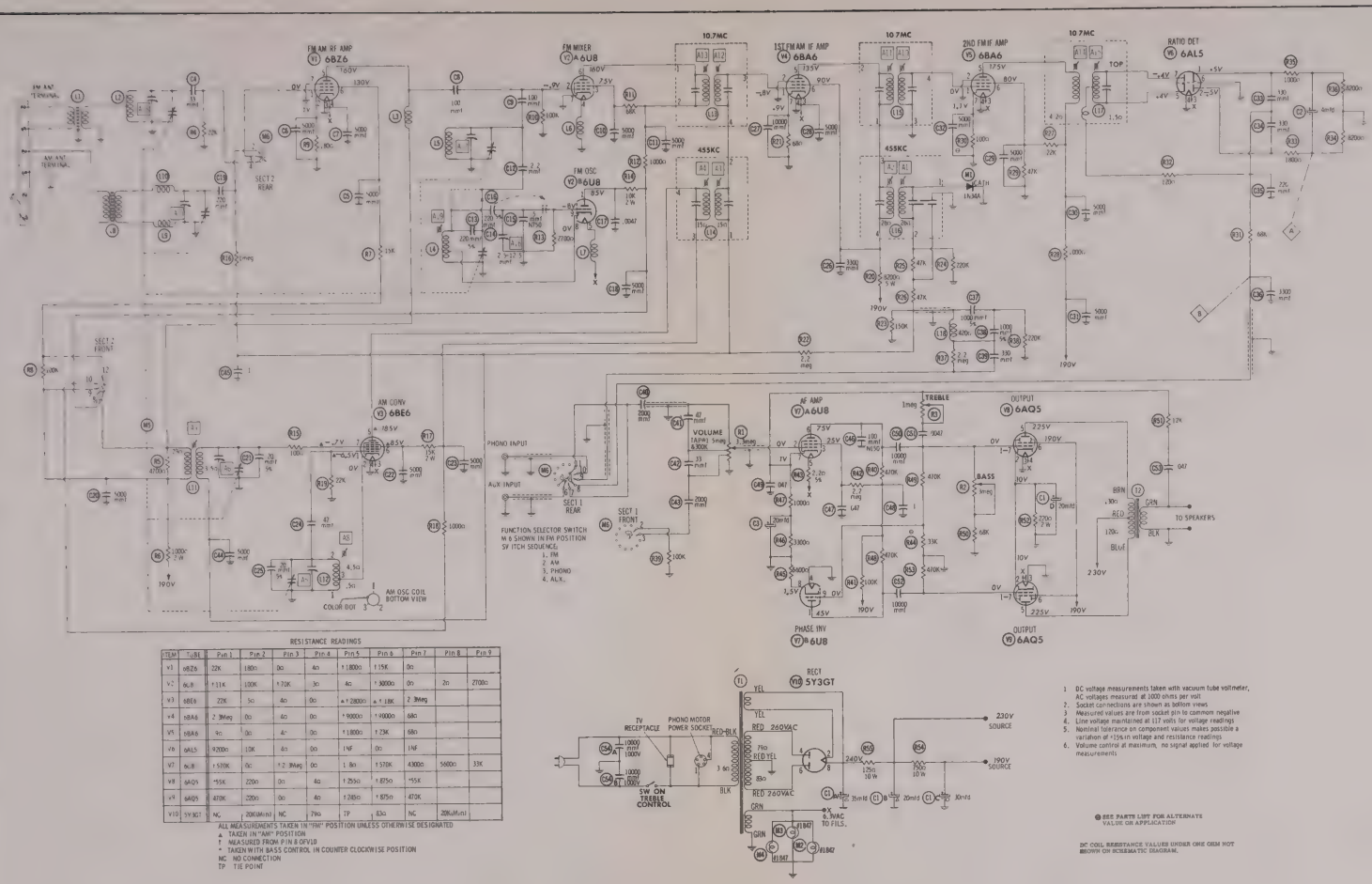


CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BZ6	22K	180Ω	0Ω	4Ω	↑18000Ω	↑15K	0Ω		
V2	6U8	↑11K	100K	↑70K	3Ω	4Ω	↑30000Ω	0Ω	2Ω	27000Ω
V3	6BE6	22K	5Ω	4Ω	0Ω	∞↑28000Ω	∞↑18K	2.2Meg		
V4	6BA6	2.2Meg	0Ω	4Ω	0Ω	↑90000Ω	↑90000Ω	68Ω		
V5	6BA6	9Ω	0Ω	4Ω	0Ω	↑18000Ω	↑23K	68Ω		
V6	6AL5	9200Ω	10K	4Ω	0Ω	1MF	0Ω	1MF		
V7	6U8	↑510K	0Ω	↑2.2Meg	0Ω	1.8Ω	↑510K	43000Ω	5600Ω	33K
V8	6AQ5	↑55K	220Ω	0Ω	4Ω	↑235Ω	↑875Ω	↑55K		
V9	6AQ5	470K	220Ω	0Ω	4Ω	↑235Ω	↑875Ω	470K		
V10	5Y3GT	NC	20K(Min)	NC	2Ω	TP	83Ω	NC	20K(Min)	

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED
∆ TAKEN IN "AM" POSITION
↑ MEASURED FROM PIN 8 OF V1,D
* TAKEN WITH BASS CONTROL IN COUNTER CLOCKWISE POSITION
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt
2. Socket connections are shown as bottom views
3. Measured values are from socket pin to common negative
4. Line voltage maintained at 117 volts for voltage readings
5. Nominal tolerance on component values makes possible a variation of ±5% in voltage and resistance readings
6. Volume control at maximum, no signal applied for voltage measurements

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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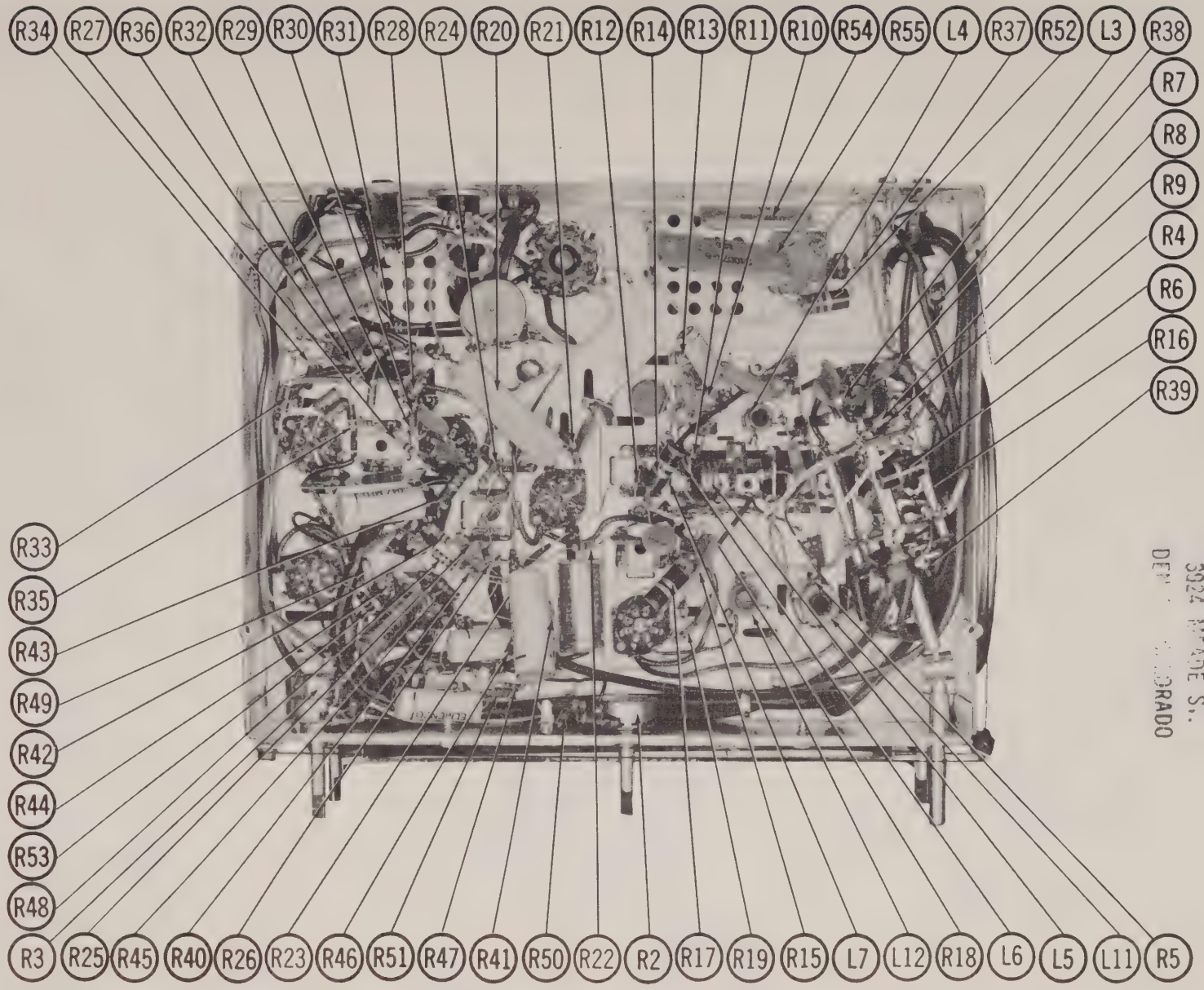
374-13



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

SPARTAN
CHASSIS CR-741AA

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.
Treble to sharp tune position.

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.01MFD	High side to pin 7 (grid) of 6BE6 (V3). Low side to chassis.	455KC (400∿ Mod.)	AM	1000KC	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2	10MMF	High side thru dummy to AM Antenna terminal. Low side to chassis.	1400KC	"	1400KC	"	A5, A6 A7	"
3	"	"	600KC	"	600KC	"	A8, A9	Adjust for maximum output. Repeat step 1 & 2.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4	.01MFD	High side to pin 5 (plate) of 6BZ6 (V1). Low side to chassis.	10.7MC (unmod.)	FM	Low frequency end of dial	DC probe thru 1Meg to point (A) Common to chassis.	A10, A11, A12, A13, A14	Adjust for maximum deflection.
5	"	"	"	"	"	DC probe thru 1Meg to point (B) Common to chassis.	A15	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4	.01MFD & 1000Ω in series	High side to pin 5 (plate) of 6BZ6 (V1). Low side to chassis.	10.7MC (300KC Swp)	FM	Low frequency end of dial	Vert Amp. thru 1Meg to point (A) Low side to chassis.	A10, A11, A12, A13 A14	Disconnect stabilizing capacitor C2. Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
5	"	"	"	"	"	Vert Amp. thru 100K to point (B) Low side to chassis.	A15	Reconnect stabilizing capacitor C2. Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A14 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
6	120Ω & 150Ω Carbon Resistors	High side thru 120Ω to FM Antenna terminal. Low side thru 150Ω to chassis.	106MC	FM	106MC	DC probe thru 1Meg to point (A) Common to chassis.	A16, A17, A18	Adjust for maximum deflection.
7	"	"	90MC	"	90MC	"	A19	Adjust for maximum deflection. Repeat steps 6 & 7.

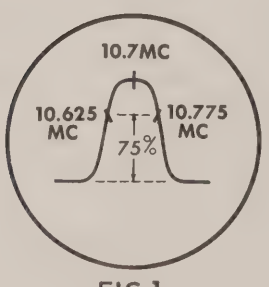


FIG. 1

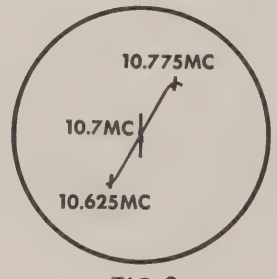


FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	6BZ6	
V2	FM Mixer-Oscillator	6U8	
V3	AM Converter	6BE6	
V4	1st. IF Amplifier	6BA6	
V5	2nd FM IF Amplifier	6BA6	

ITEM No.	USE	TYPE	NOTES
V6	Ratio Detector	6AL5	
V7	AF Amp. - Phase Inverter	6U8	
V8	Output	6AQ5	
V9	Output	6AQ5	
V10	Rectifier	5Y3GT	

ELECTROLYTIC CAPACITORS

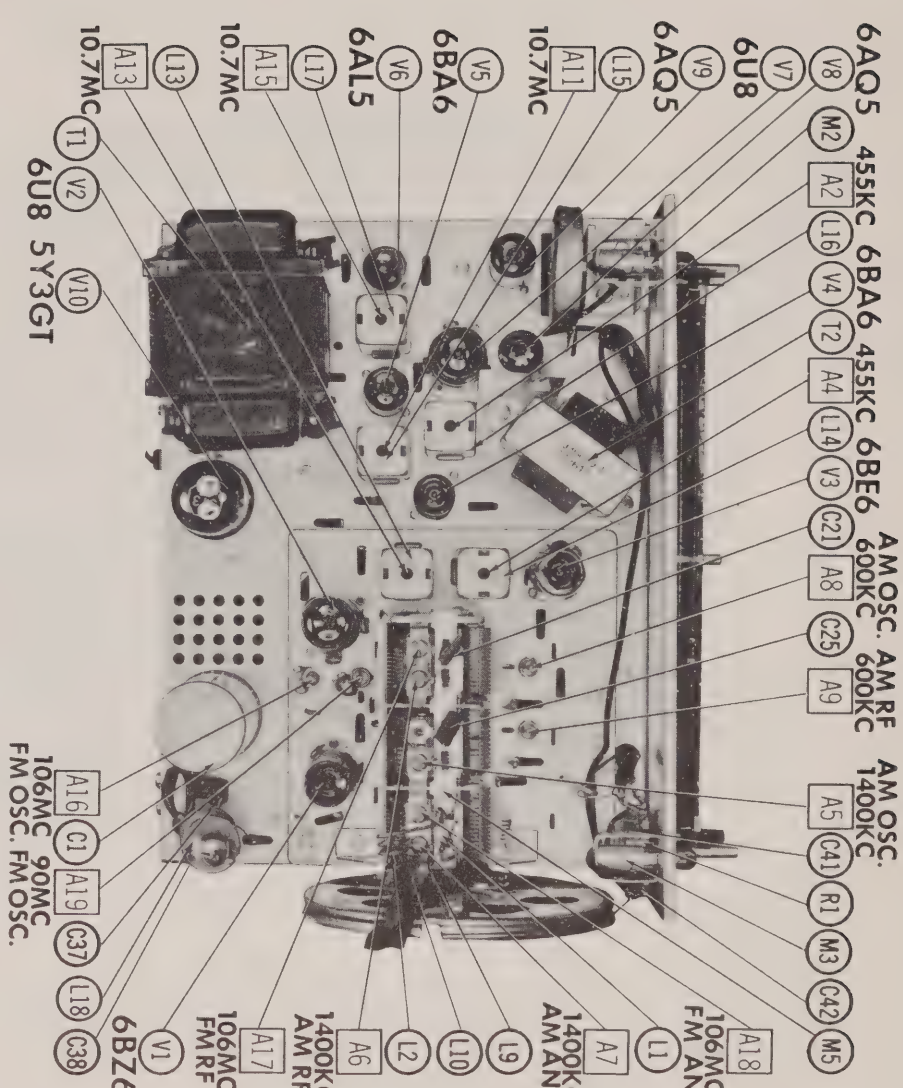
ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA SPARTAN PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲35	450	270021-59	AFH4-79	C1060	FP345.3	TMQ-87	Q-380	TVL-4737
B	▲20	450			BR3045	TC77	TD-8-450	FM-4510	
C	■30	450							
D	20	25							
C2	4	50	270027-27	SRE50V5	BBR4-50	TC30	TD-4-50	FM-0504	TVA-1303
C3	20	25	270027-28	SRE25V20	BBR20-25	TC26	TD-20-150	MMT-0220	TE-1206

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA SPARTAN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C4	33		250187-47	1468-000033	DD-330	5W5T22	ED-33	UC-5433	1FM-433	
C5	5000		250175-1	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C6	5000		250175-1	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C7	5000		250175-1	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C8	100	500	250187-53	1468-001	DD-101	5W5T1	ED-100	MC235	1FM-31	
C9	100	500	250187-53	1468-001	DD-101	5W5T1	ED-100	MC235	1FM-31	
C10	5000		250175-1	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C11	5000		250175-1	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C12	2.2		250221-118	NP0-SI 2.2	TCZ-2R2	C10V22C	TCO-2.2		5TCCB-V22	
C13	220	500	250159-55	1469-00022	TCZ-220	22R5T22	TCO-220		MS-322	5%
C14	2.5-12.5		250188-9							
C15	5		250088-138	N750-SI 5	TCN-5	C10V5U	TC7-5	NT-555	5TCUB-V5	N750
C16	220	500	250159-55	1469-00022	TCZ-220	22R5T22	TCO-220		MS-322	5%
C17	.0047	400	250211-5	BPD-0047	DD-472	CUB6D47	GP-4700	GEM-6247	6TM-D47	
C18	5000		250175-1	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C19	220	500	250187-57	1468-00022	DD-221	5W5T22	ED-220	UC-5322	1FM-322	
C20	5000		250175-1	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C21	20	500	250187-5	1469-00002	TCZ-20	22R5Q2	TCO-20	ZT-542	MS-42	5%
C22	5000		250175-1	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C23	5000		250175-1	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C24	47	500	250187-49	1468-000047	DD-470	22R5Q47	ED-47	UC-5447	1FM-447	
C25	20	500	250187-5	1469-00002	TCZ-20	22R5Q2	TCO-20	ZT-542	MS-42	5%
C26	3300		250175-28	BPD-0033	D6-332	BYA10D33	ED-0033	UC-5233	5HK-D33	
C27	10000		250218-19	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C28	5000		250175-1	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C29	5000		250175-1	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C30	5000		250175-1	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C31	5000		250175-1	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C32	5000		250175-1	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C33	330		250207-49	SI 330	D6-331	LT6T33	GP-330	UC-5333	5GA-T33	
C34	330		250207-49	SI 330	D6-331	LT6T33	GP-330	UC-5333	5GA-T33	
C35	220		250218-5	BPD-00022	DD-221	L10T22	ED-220	UC-5322	5GA-T22	
C36	3300		250175-28	BPD-0033	D6-332	BYA10D33	ED-0033	UC-5233	5HK-D33	
C37	1000		250228-354	1464-001		1R5D1	CY20C102J	MCE255	MS-21	5%
C38	1000		250228-354	1464-001		1R5D1	CY20C102J	MCE255	MS-21	5%
C39	330		250207-49	SI 330	D6-331	LT6T33	GP-330	UC-5333	5GA-T33	
C40	2000		250218-20	BPD-002	DD-202	BYA10D2	ED-002	DC522	5HK-D2	
C41	47		250218-17	BPD-000047	DD-470	L10Q47	ED-47	UC-5447	5GA-Q47	
C42	33		250218-21	BPD-000033	DD-330	L10Q33	ED-33	UC-5433	5GA-Q33	
C43	2000		250218-20	BPD-002	DD-202	BYA10D2	ED-002	DC522	5HK-D2	
C44	5000		250175-1	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C45	.1	200	250202-13	P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	
C46	100		250218-22							N150
C47	.047	200	250211-11	BPD-05	DF-503	CUB2S47		GEM-4147	2TM-S47	
C48	.1	400	250211-13	P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA SPARTAN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C49	.047	400	250211-11	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C50	10000		250218-19	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C51	.0047	400	250211-5	BPD-0047	DD-472	CUB6D47	GP-4700	GEM-6247	6TM-D47	
C52	10000		250218-19	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C53	.047	200	250211-11	BPD-05	DF-503	CUB2S47		GEM-4147	2TM-S47	
C54A	10000	1000	250219-3	P1088N-01	DD-103	BYA10S1		GEM-1011	20HKB-S1	
B	10000	1000		P1088N-01	DD-103	BYA10S1		GEM-1011	20HKB-S1	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SPARTAN PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1	3.3Meg	½	220131-3				UDT-303	Volume, Tap② 300K & 1.5Meg
R2A	3Meg	½	220072-27	B-85	A47-3Meg-Z	Q13-140	U57	Bass
B	Shaft			Not req.	FS-3	Not req.	Not req.	
R3A	1Meg	½	220073-20	B-70	A47-1Meg-Z	Q13-137	U53	Treble
B	Shaft			Not req.	FS-3	Not req.	Not req.	
C	Switch			KB-1	SWE-12	76-1	US-26	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA SPARTAN PART No.	IRC PART No.	NOTES
R4	22K		230104-78	BTS-22K	
R5	4700Ω		230104-70	BTS-4700	
R6	1000Ω	2	230096-62	BTB-1000	
R7	15K		230104-76	BTS-15K	
R8	100K		230104-86	BTS-100K	
R9	180Ω		230104-53	BTS-180	
R10	100K		230104-86	BTS-100K	
R11	68K		230104-84	BTS-68K	
R12	1000Ω		230104-62	BTS-1000	
R13	2700Ω		230104-67	BTS-2700	
R14	10K	2	230096-74	BTB-10K	
R15	100Ω		230104-50	BTS-100	
R16	1Meg		230104-98	BTS-1Meg	
R17	15K	2	230096-76	BTB-15K	
R18	1000Ω		230104-62	BTS-1000	
R19	22K		230104-78	BTS-22K	
R20	8200Ω	5	240071-13	PW10-8200	
R21	68Ω		230104-48	BTS-68	
R22	2.2Meg		230104-102	BTS-2.2Meg	
R23	150K		230104-88	BTS-150K	
R24	220K		230104-90	BTS-220K	
R25	47K		230104-82	BTS-47K	
R26	47K		230104-82	BTS-47K	
R27	22K		230104-78	BTS-22K	
R28	1000Ω		230104-62	BTS-1000	
R29	47K		230104-82	BTS-47K	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA SPARTAN PART No.	IRC PART No.	NOTES
R30	100Ω		230104-50	BTS-100	Note 1
R31	68K		230104-84	BTS-68K	
R32	120Ω		230104-51	BTS-120	
R33	1800Ω		230104-65	BTS-1800	
R34	8200Ω		230104-73	BTS-8200	
R35	1000Ω		230104-62	BTS-1000	
R36	8200Ω		230104-73	BTS-8200	
R37	2.2Meg		230104-102	BTS-2.2Meg	
R38	220K		230104-90	BTS-220K	
R39	100K		230104-86	BTS-100K	
R40	470K		230104-94	BTS-470K	
R41	100K		230104-86	BTS-100K	
R42	2.2Meg		230104-102	BTS-2.2Meg	
R43	2.2Ω 5%		230109-2		
R44	33K		230104-80	BTS-33K	Note 2
R45	5600Ω		230104-71	BTS-5600	
R46	3300Ω		230104-68	BTS-3300	
R47	1000Ω		230104-62	BTS-1000	
R48	470K		230104-94	BTS-470K	
R49	470K		230104-94	BTS-470K	
R50	68K		230104-84	BTS-68K	
R51	12K		230104-75	BTS-12K	
R52	220Ω	2	230106-54	BTB-220	
R53	470K		230104-94	BTS-470K	
R54	750Ω	10	240071-23	PW10-750	
R55	125Ω	10	240071-6	1 3/4A-125	

Note 1. Some versions may use a 68Ω ½W Resistor (Part #230104-48)
Note 2. Some versions may use a 470K ½W Resistor (Part #230104-94)

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA SPARTAN PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC ② .375A	550VCT ② .110A	5VAC ② 2A	6.3VAC ② 3.6A	300081-3	P9208 ① ②		PC-8405 ① ②	22R05 ① ② ③	R-12A ① ②

① Drill new mounting holes.
② Tape center tap on 6.3V Winding.
③ Use universal mounting brackets.

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA SPARTAN PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	6500Ω CT	3-4Ω	330039-1	Z1007	A-2901	A-3823	24S61	S-53X	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA SPARTAN PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	FM Ant. Trans.	360491-3				
L2	FM Ant. Coil	360656-1				
L3	RF Choke	360522-9	19-1002		4606	2 Microhenries
L4	FM Osc. Coil	360628-1				
L5	FM RF Coil	360629-1				
L6	Fil. Choke	360522-9	19-1002		4606	2 Microhenries
L7	Fil. Choke	360522-9	19-1002		4606	2 Microhenries
L8	Loop Stick	460894-3				
L9	Ant. Coil	360522-9	19-1002		4606	2 Microhenries
L10	Ant. Coil	360522-9	19-1002		4606	2 Microhenries
L11	AM RF Coil	360348-2			A-5495-RF	
L12	AM Osc. Coil	360407-2	14-1033			
L13	1st. FM IF	360626-1	16-3487	FM-254	1463	
L14	1st. AM IF	360611-1	16-6758	BC-352	12-C1	
L15	2nd. FM IF	360626-1	16-3487	FM-254	1463	
L16	2nd. AM IF	360625-1	16-6770	BC-355	12-C6	
L17	Ratio Det.	360627-1	17-3498	FM-255	1465	
L18	10KC Filter	360621-1				

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA SPARTAN PART No.	CBS PART No.	SYLVANIA PART No.	NOTES
M1	1N34A	530030-2	1N34A	1N34A	Audio Det. (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	SPARTAN PART No.	NOTES
M2	Dial Light	180161-17	#1847
M3	Dial Light	180161-17	#1847
M4	Pilot Light	180161-17	Type #1847
M5	Tuning Cap.	260136-1	6 Gang (AM Sections: Ant. 25-575MMF, RF 25-195MMF, Osc. 25-575MMF)
M6	Switch	160264-1	Function (Rotary Wafer Type)

SYLVANIA MODELS 4301, 4303, 4305, (Ch. 1-609-3, 1-609-4)

PROPERTY OF
E. F. BLANKENSHIP
3324 Mi
DENVE

SYLVANIA MODELS 4301, 4303, 4305, (Ch. 1-609-3, 1-609-4)

MODEL 4303

SYLVANIA MODELS 4301, 4303, 4305, (Ch. 1-609-3, 1-609-4)

TRADE NAME	Sylvania Models 4301, 4303, 4305 (Ch. 1-609-3, 1-609-4)
MANUFACTURER	Sylvania Electric Prod., Inc., Radio & Tel. Div., 700 Ellicott St., Batavia, N. Y.
TYPE SET	AC Operated Phono Amplifier With 4 Speed Automatic Record Changer
TUBES (Four)	Types 12AX7 AF Amp. - Phase Inv., (2) 6V6GT Output, 5Y3GT Rectifier
POWER SUPPLY	105-125 Volts AC-60 Cycles RATING .63 Amp. @ 117 Volts AC (70 Watts)

FOR SERVICE INFORMATION ON RECORD CHANGER PART #1-317-1--SEE SIMILAR V-M MODEL 1200 A--PHOTOFACT SET 353 FOLDER 16.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

SYLVANIA
MODEL 4301 (Ch. 1-609-3)

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF-Amp. -- Phase Inv.	12AX7	
V2	Output	6V6GT	
V3	Output	6V6GT	
V4	Rectifier	5Y3GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	SYLVANIA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲20	450	161-4021	AFH4-14	D0130	FP444	TMQ-12	Q-040	TVL-4763
B	■20	450							
C	▲20	450							
D	20	450							
C2	10	25	161-1000	PRS25V10	BBR10-25	TC22	TD-10-25	MT-0210	TVA-1204

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	SYLVANIA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C3	.047	400	160-06147	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C4	.047	600	160-06147	BPD-05	DF-503	CUB6S47		GEM-6147	6TM-S47	
C5	.047	600	160-06147	BPD-05	DF-503	CUB6S47		GEM-6147	6TM-S47	
C6	.0033	600	160-06233	BPD-0033	D6-332	CUB6D33	GP-3300	GEM-6233	6TM-D33	
C7	.0033	600	160-06233	BPD-0033	D6-332	CUB6D33	GP-3300	GEM-6233	6TM-D33	
C8	1.0	50	169-0059	P288N-1.0		CUB2W1		GEM-21	2TM-M1	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SYLVANIA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	2Meg	½	153-0116	ABT-175		Q13-139XX	UDT-296	Volume, Tap@ 500K & 1Meg
B	Shaft			AK-11		Not Req.	Not Req.	
R2A	1Meg	½	153-0117	B-70	A47-1Meg-Z	Q13-137	U53	Bass
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R3A	500K	½	153-0118	B-60	A47-500K-Z	Q13-133	U48	Treble
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

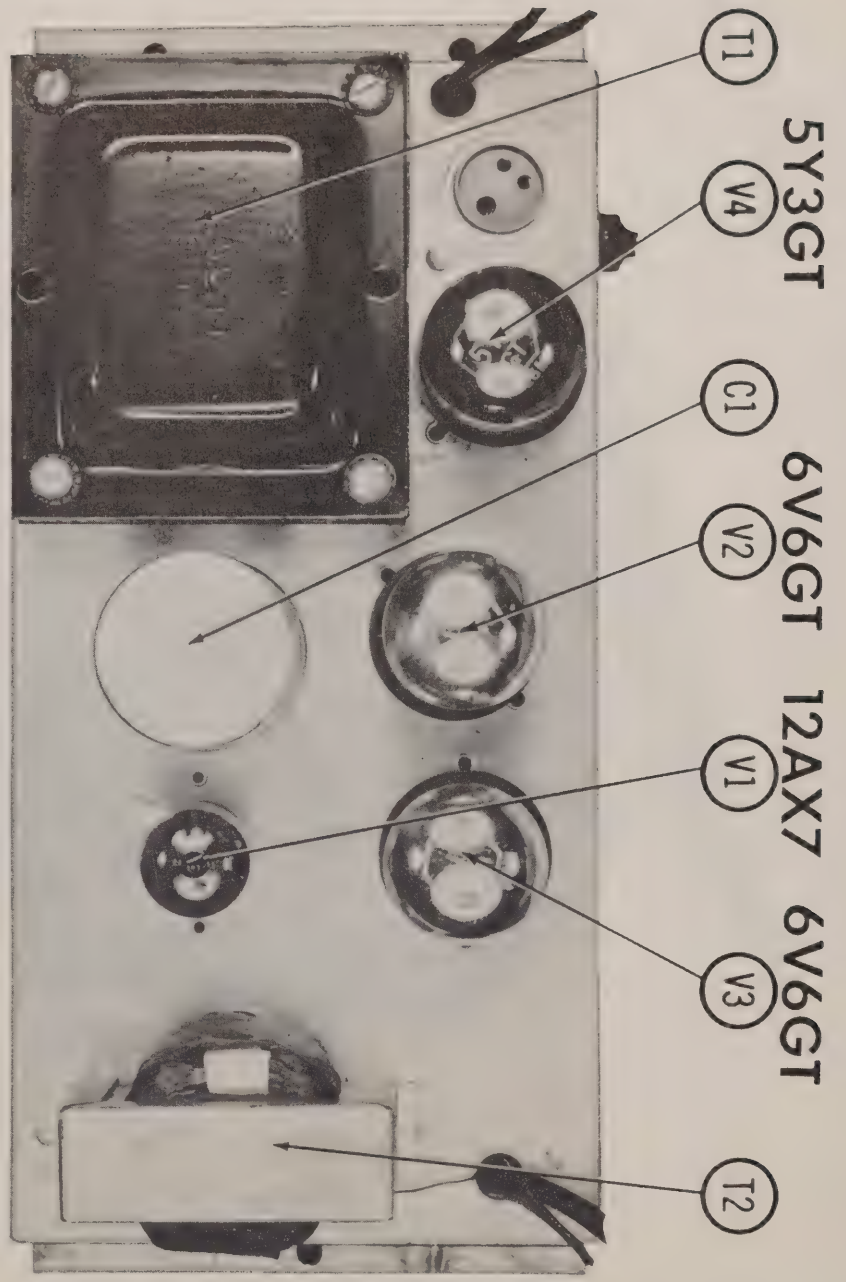
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SYLVANIA PART No.	IRC PART No.	
R4	6.8Meg		181-0685	BTS-6.8Meg	
R5	330K		181-0334	BTS-330K	
R6	1500Ω		181-0152	BTS-1500	
R7	39K		181-0393	BTS-39K	
R8	330K		181-0334	BTS-330K	
R9	390K		181-0394	BTS-390K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SYLVANIA PART No.	IRC PART No.	
R10	470K		181-0474	BTS-470K	
R11	200Ω	5	187-0031	PW7-200	
R12	100K		181-0104	BTS-100K	
R13	470Ω	1	182-0471	BTA-470	
R14	68Ω	1	182-0680	BTA-68	

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	SYLVANIA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @ .63A	585VCT @ .085A	5VAC @ 2A	6.3VAC @ 1.7A	141-0068	P9209	P-3052	PM8405	22R04	R-12B

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	SYLVANIA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	9100Ω CT	3-4Ω	143-0048	Z1007 ①	A-2936①	A-3870	26S59	S-55X	① Drill new mounting hole.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	SYLVANIA PART No.	QUAM PART No.	
SP1	4"	PM	13Ω	539-0407 ①②	4A1T ②	① Used in Models 4301, 4303.
	4"	PM	13Ω	539-0423 ②③	4A1T ②	② Parallel & Phase
SP2	4"	PM	13Ω	539-0407 ①②	4A1T ②	③ Used in Model 4305.
SP3	12"	PM	3-4Ω	539-1207 ①②	12A31 ②	
	12"	PM	3-4Ω	539-1208 ②③	12A31 ②	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	SYLVANIA PART No.	REPLACEMENT DATA
K1	Audio Coupling Net.	27MMF, 18MMF, 820MMF, 4700MMF, 3300MMF, 68K, 330K, 47K	190-0030	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	SYLVANIA PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	MOUNT	
M1	916-0006	118-TS	N8-1 and N8-3	56	PT-1	

ASTATIC NEEDLE LISTING SHOWN ABOVE IS SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	SYLVANIA PART No.	JENSEN PART No.	WALCO PART No.	
M2	902-0006 (78RPM)	† CRA-55 or ♦ CRA-55D	W-64S	† Jewel ♦ Diamond
	902-0007 (LP)	† CRA-55LP or ♦ CRA-55LPD	W-64MGS	

MISCELLANEOUS

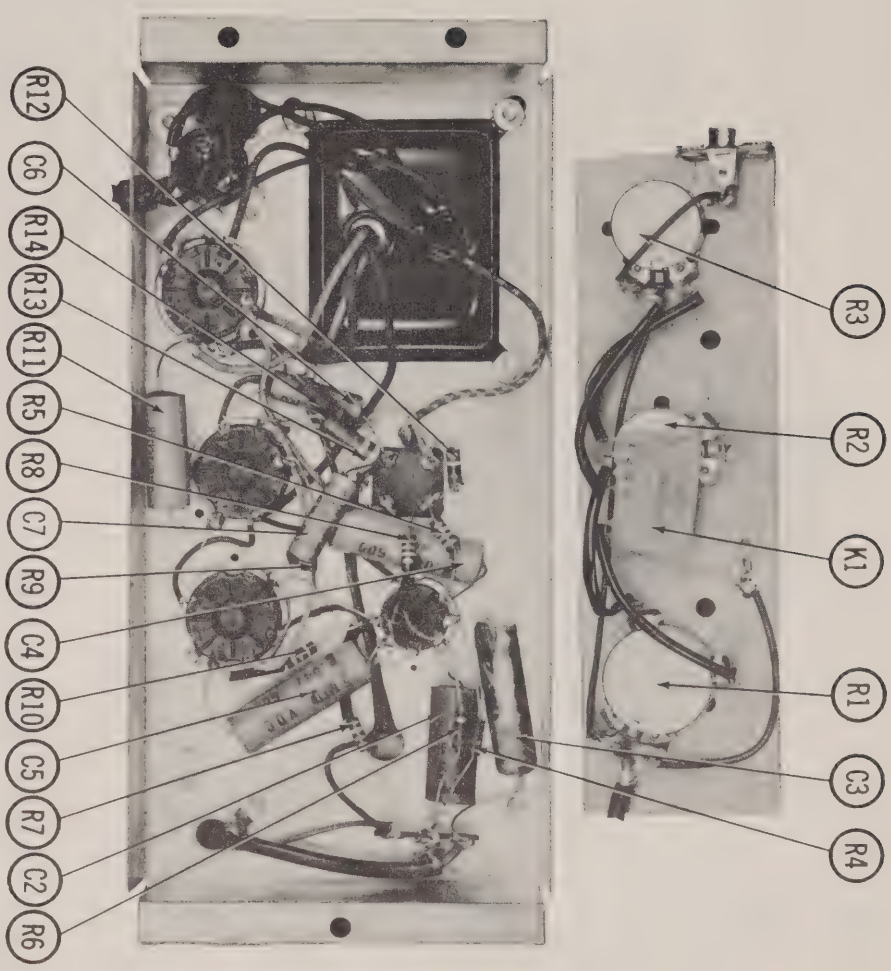
ITEM No.	PART NAME	SYLVANIA PART No.	NOTES
M3	Lamp	611-0007	120V, 10W (Model 4303 only)
M4	Switch	571-0005	Off-On-Reject
M5	Motor	924-0007	Phono

CABINETS & CABINET PARTS

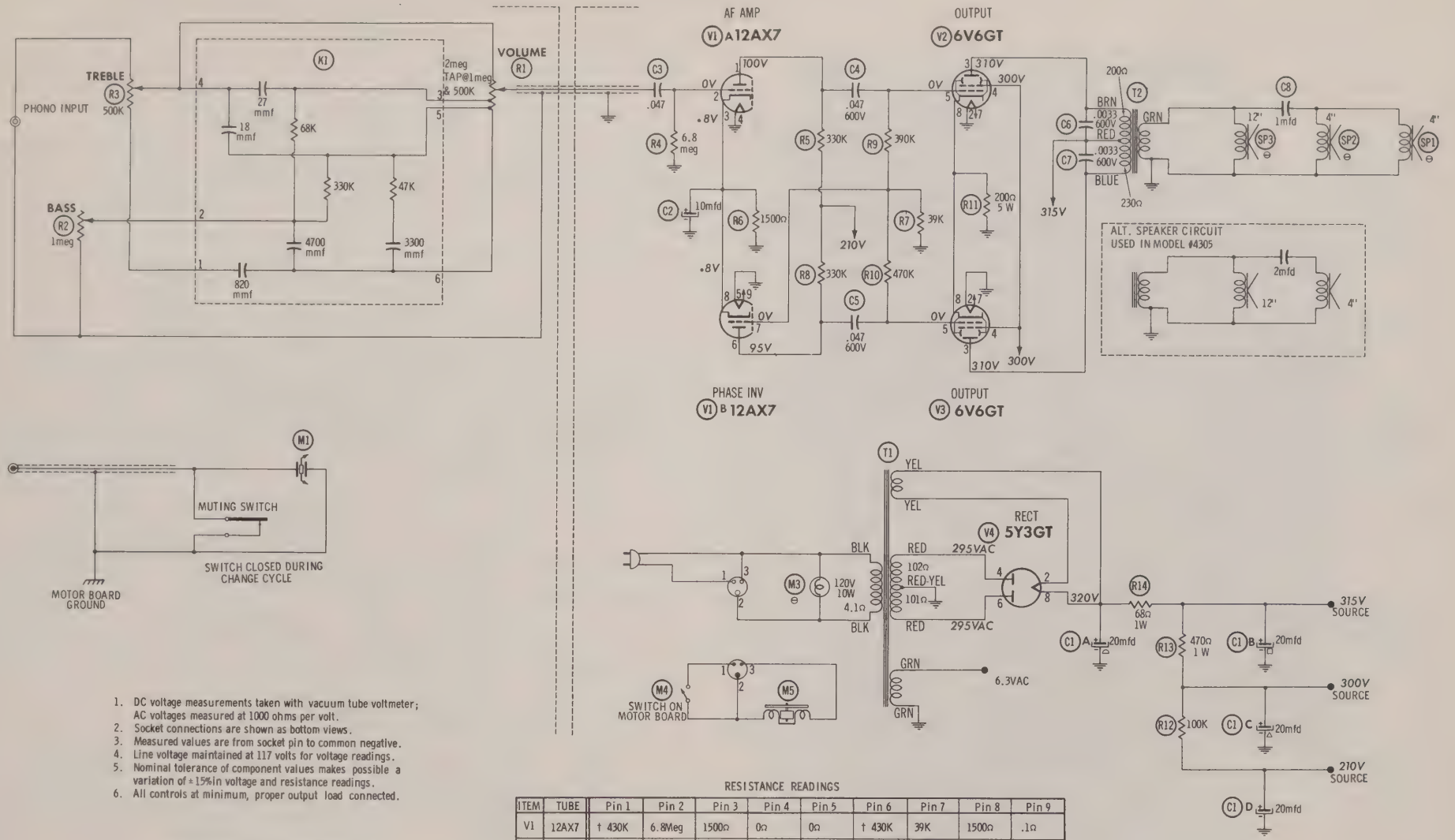
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	740-0143	Treble, Bass, Volume (Model 4301, 4303)
Knob	740-0155	Treble, Bass, Volume (Model 4305)
Knob	742-0013	Speed Selector, Off-On-Reject

CHASSIS—BOTTOM VIEW



SYLVANIA MODEL 4301 (Ch. 1-609-3)



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

Ⓔ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	† 430K	6.8Meg	1500Ω	0Ω	0Ω	† 430K	39K	1500Ω	.1Ω
V2	6V6GT	NC	0Ω	† 268Ω	† 540Ω	425K	NC	.1Ω	200Ω	
V3	6V6GT	NC	0Ω	† 300Ω	† 540Ω	510K	NC	.1Ω	200Ω	
V4	5Y3GT	NC	20K(Min)	NC	102Ω	NC	101Ω	NC	20K(Min)	

† MEASURED FROM PIN 8 OF V4
NC NO CONNECTION

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1957

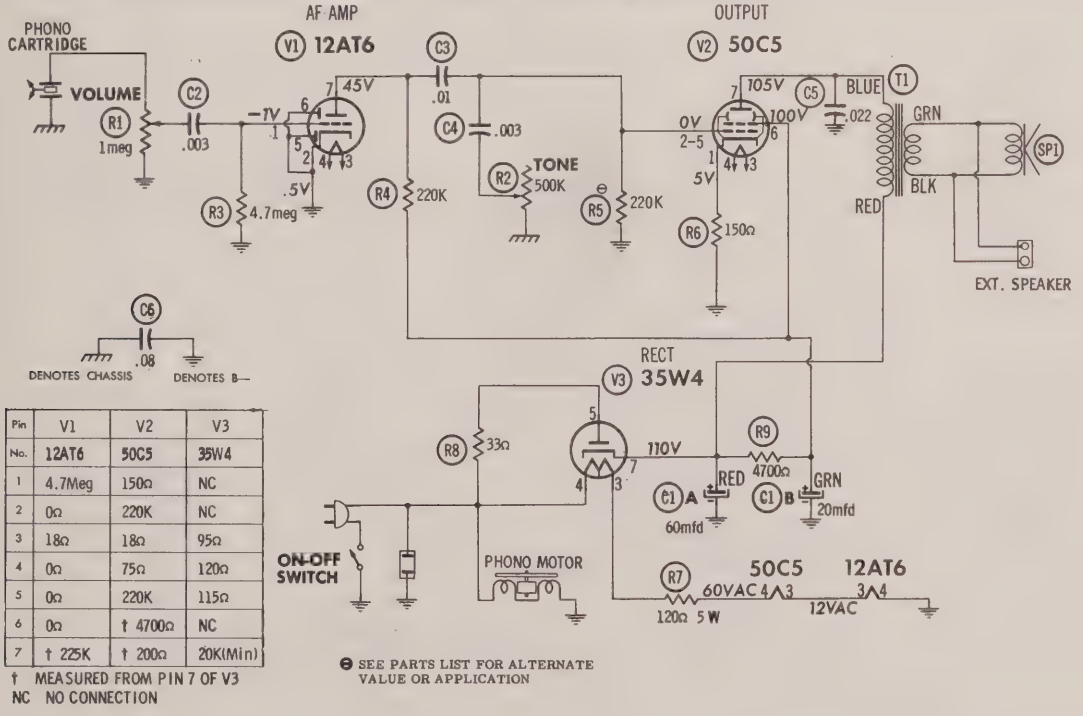
PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

V-M
MODEL 1250

V-M
MODEL 1250

TRADE NAME	V-M Model 1250
MANUFACTURER	V-M Corp., Benton Harbor, Michigan
TYPE SET	AC Operated Phono Amplifier With 4 Speed Automatic Record Changer
TUBES (Three)	Types 12AT6 AF Amplifier, 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .3 Amp. @ 117 Volts AC (25 Watts Without Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER — SEE V-M MODEL 1200A — PHOTOFACT SET 353 FOLDER 16



Pin No.	V1 12AT6	V2 50C5	V3 35W4
1	4.7Meg	150Ω	NC
2	0Ω	220K	NC
3	18Ω	18Ω	95Ω
4	0Ω	75Ω	120Ω
5	0Ω	220K	115Ω
6	0Ω	† 4700Ω	NC
7	† 225K	† 200Ω	20K(Min)

† MEASURED FROM PIN 7 OF V3
NC NO CONNECTION

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1957

374-15

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF Amplifier	12AT6	
V2	Output	50C5	
V3	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA V-M PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	60	150	12007	PRS150V50 3020	BBRQ42215C	TCT3107		D-075 MT-0525	R1422 *
B	20	150							
C	20	50	(Note 1)						

Note 1. C1C is not used in some versions. * Non Catalog Item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA V-M PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	.003	400	12004	BPD-0033	D6-302	CUB6D3	GP-3000	GEM-623	6TM-D3	
C3	.01	400	12003	BPD-01	DD-103	CUB4S1	GP-10000	GEM-411	4TM-S1	
C4	.003	400	12004	BPD-003	D6-302	CUB6D3	GP-3000	GEM-623	6TM-D3	
C5	.022	400	12026	BPD-02	DD-203	CUB4S22	GP-2200	GEM-4122	4TM-S22	
C6	.08	400	12072							

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA V-M PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1Meg	½	11991	B-70	A47-1Meg-Z	Q13-137	U53	Volume
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R2A	500K	½	11990	B-60	A47-500K-Z	Q13-133	U48	Tone
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA V-M PART No.	IRC PART No.	NOTES
R3	4.7Meg		11613	BTS-4.7Meg	
R4	220K		11293	BTS-220K	
R5	220K		11293	BTS-220K	Note 1
R6	150Ω		10533	BTS-150	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA V-M PART No.	IRC PART No.	NOTES
R7	120Ω	5	11953-10		
R8	33Ω		10373	BTS-33	
R9	4700Ω		10893	BTS-4700	

Note 1. 470K may be used in some versions (Part #11373)

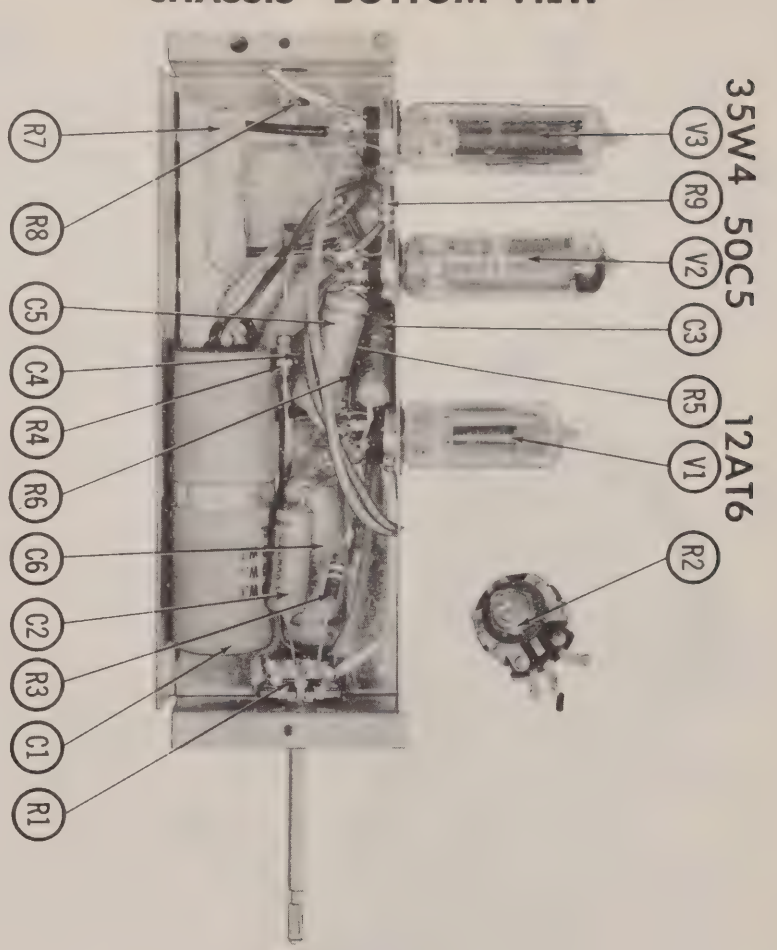
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA V-M PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2000Ω	3-4Ω	Part of Spkr.	Z1101 ①	A-2928①	A-3332①	24S50 ①	S-2X ①	① Bend ears down.

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA V-M PART No.	QUAM PART No.	NOTES
SP1	4" X 6"	PM	3-4Ω	6040 ①	46A07	① Includes T1

CHASSIS—BOTTOM VIEW



PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA V-M PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. MOUNT	REMARKS
M1	7477	55-T	GD-J	56	PT-2	

ASTATIC NEEDLE LISTING SHOWN ABOVE IS SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA V-M PART No.	JENSEN PART No.	WALCO PART No.	REMARKS
M2		† S-66 or †♦ S-66SD or ♦ S-66D	† W-75TPS or †♦ W-75DS or ♦ W-75TPD	† Jewel ♦ Diamond

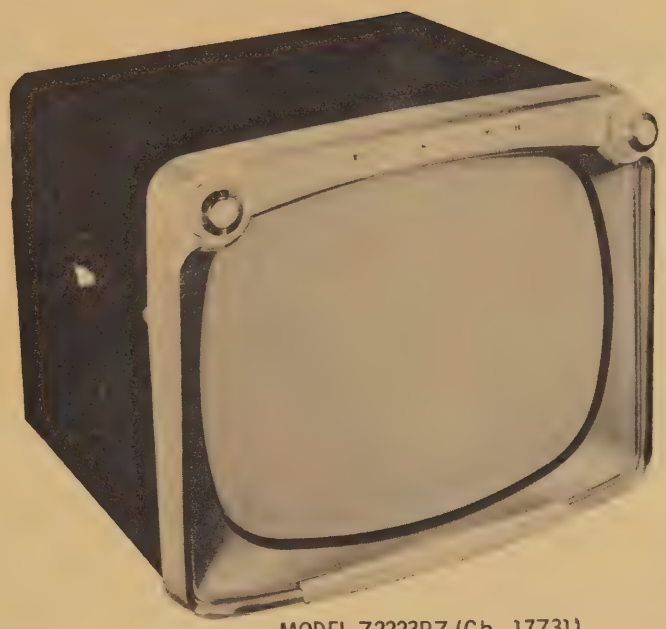
PHOTOFACT* Folder
*TRADE MARK

ZENITH CHASSIS 17Z31, U, 17Z32, U, Q, QU, 17Z34Q, QU

IMPORTANT FILING NOTICE

The contents for this envelope will be found among the last folders in this complete set of folders . . . unless it has been purchased as part of a complete volume of PHOTOFACTS assembled in a DeLuxe Binder.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.



MODEL Z2223RZ (Ch. 17Z31)

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

ZENITH CHASSIS 17Z31,
U, 17Z32, U, Q, QU, 17Z34Q, QU

TRADE NAME	Zenith	MODELS	CHASSIS
		Z2223CZ, EZ, RZ, YZ	17Z31
		Z2223CZU, EZU, RZU, YZU	17Z31U
		Z2243EZ, RZ, Z2244EZ, RZ, Z2249EZ, RZ, Z2251EZ, RZ, Z2282EZ, RZ	17Z32
		Z2243EZU, RZU, Z2244EZU, RZU, Z2249EZU, RZU, Z2251EZU, RZU, Z2282EZU, RZU	17Z32U
		Z3000EZ, RZ, Z3004EZ, RZ	17Z32Q
		Z3000EZU, RZU, Z3004EZU, RZU	17Z32QU
		Z3001EZ, RZ, Z3008EZ, RZ	17Z34Q
		Z3001EZU, RZU, Z3008EZU, RZU	17Z34QU

MANUFACTURER	Zenith Radio Corp., 6001 Dickens Ave., Chicago 39, Illinois
TYPE SET	Television Receiver
TUBES	Seventeen
POWER SUPPLY	110-120 Volts AC, 60 Cycle RATING 185 Watts, 1.5 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 41.25MC, Sound IF 45.75MC (Intercarrier)

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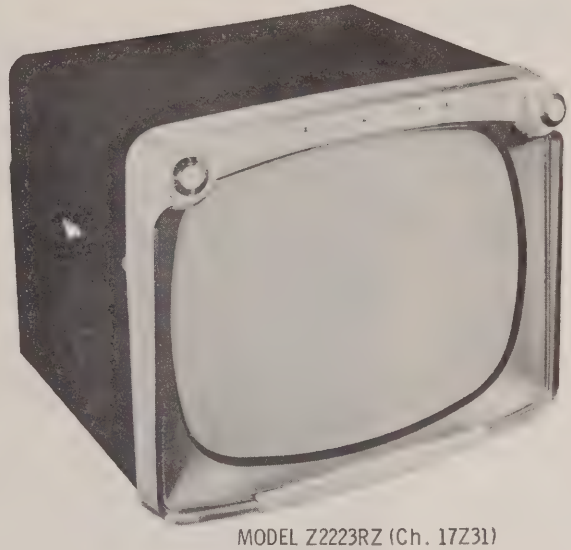
DATE 10-57 SET 374 FOLDER 16

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 8 metal screws and the rear cover.
2. Remove 2 speaker leads.
3. Remove 1 metal screw from the chassis brace at the lower left corner of chassis.
4. Remove 2 metal screws from the top chassis brace.
5. Remove 2 metal screws from the bottom chassis brace.
6. Remove the chassis.
7. Remove 4 speaker nuts and the speaker.



MODEL Z2223RZ (Ch. 17Z31)

PROPERTY OF
E. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

MODELS	CHASSIS
Z2223CZ, EZ, RZ, YZ	17Z31
Z2223CZU, EZU, RZU, YZU	17Z31U
Z2243EZ, RZ, Z2244EZ, RZ, Z2249EZ, RZ, Z2251EZ, RZ, Z2282EZ, RZ	17Z32
Z2243EZU, RZU, Z2244EZU, RZU, Z2249EZU, RZU, Z2251EZU, RZU, Z2282EZU, RZU	17Z32U
Z3000EZ, RZ, Z3004EZ, RZ	17Z32Q
Z3000EZU, RZU, Z3004EZU, RZU	17Z32QU
Z3001EZ, RZ, Z3008EZ, RZ	17Z34Q
Z3001EZU, RZU, Z3008EZU, RZU	17Z34QU

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF oscillator is possible by removing the channel selector knob. Set the fine tuning at the center of its range. The adjustments are accessible, one at a time, as the channel selector is rotated. Adjust for best picture and sound.

PICTURE TUBE SAFETY GLASS CLEANING

Remove 2 metal screws holding the metal trim at the bottom of the safety glass. Pull out at the button and down to remove.

FOCUS

Focus may be varied by the position of a strap on the base of the picture tube. The strap can be connected between pins 6 and 10 or 6 and 2. Readjust the ion trap for the best focus consistent with maximum brightness.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

The horizontal frequency coil is used as the horizontal hold control. Adjust the horizontal hold until the picture synchronizes horizontally. (For location, see tube placement chart).

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate audio detector buzz, adjust the buzz control for MINIMUM buzz and maximum sound. (For location, see tube placement chart).

FUSES

One fuse is used for horizontal sweep circuit protection. (For location, see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

ZENITH CHASSIS 17Z31,
U, 17Z32, U, Q, QU, 17Z34Q, QU

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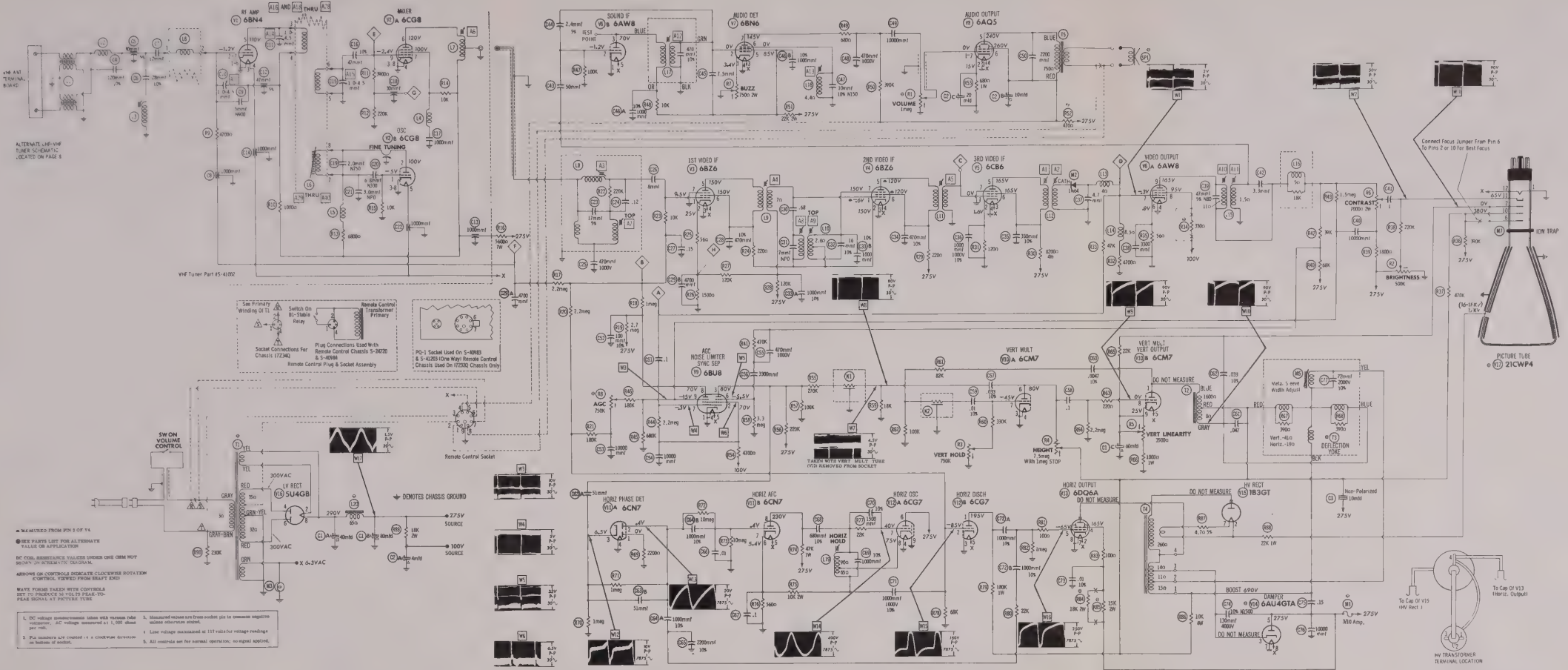
RF AMP V1 6BN4
MIXER V2A 6CG8
OSC V2B 6CG8
FINE TUNING
VHF Tuner Part #5-41092
ALTERNATE UHF-VHF TUNER SCHEMATIC LOCATED ON PAGE 8
SOUND IF V5B 6AW8
AUDIO DET V7 6BN6
AUDIO OUTPUT V8 6AQ5
VOLUME 1meg
1ST VIDEO IF V3 6BZ6
2ND VIDEO IF V4 6BZ6
3RD VIDEO IF V5 6CB6
VIDEO OUTPUT V6A 6AW8
CONTRAST 7000Ω 2W
BRIGHTNESS 500K
Connect Focus Jumper From Pin 6 To Pins 2 or 10 For Best Focus
ION TRAP
PICTURE TUBE ⊕ V17 21CWP4
AGC NOISE LIMITER SYNC SEP V9 6BU8
VERT MULT V10A 6CM7
VERT MULT VERT OUTPUT V10B 6CM7
VERT HOLD 750K
HEIGHT 7.5meg With 1meg STOP
VERT LINEARITY 3500Ω
DEFLECTION YOKE
HORIZ PHASE DET V11A 6CN7
HORIZ AFC V11B 6CN7
HORIZ HOLD
HORIZ OSC V12A 6CG7
HORIZ DISCH V12B 6CG7
HORIZ OUTPUT V13 6DQ6A
DO NOT MEASURE
HV RECT V15 1B3GT
BOOST 690V
DAMPER V16 6AU4GTA
HV TRANSFORMER TERMINAL LOCATION
To Cap Of V15 (HV Rect.)
To Cap Of V13 (Horiz. Output)
SW ON VOLUME CONTROL
LV RECT V18 5U4GB
300VAC
290V
275V SOURCE
100V SOURCE
6.3VAC
DENOTES CHASSIS GROUND
Remote Control Socket
Switch On Bi-Stable Relay
Remote Control Transformer Primary
Socket Connections For Chassis 17Z342
Plug Connections Used With Remote Control Chassis S-26720 & S-40084
Remote Control Plug & Socket Assembly
PQ-1 Socket Used On S-40983 & S-41203 (One Way) Remote Control Chassis Used On 17Z332 Chassis Only
TAKEN WITH VERT. MULT TUBE (V10) REMOVED FROM SOCKET
ZENITH CHASSIS 17Z31, U, 17Z32, U, Q, QU, 17Z34Q, QU

▲ MEASURED FROM PIN 2 OF V4

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 30 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE

1. DC voltage measurements taken with vacuum tube voltmeter. AC voltage measured as 1,000 ohms per volt.
2. Pin numbers are counted in a clockwise direction as bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings
5. All controls set for normal operation; no signal applied.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1957

TUBE PLACEMENT CHART

PROPERTY OF
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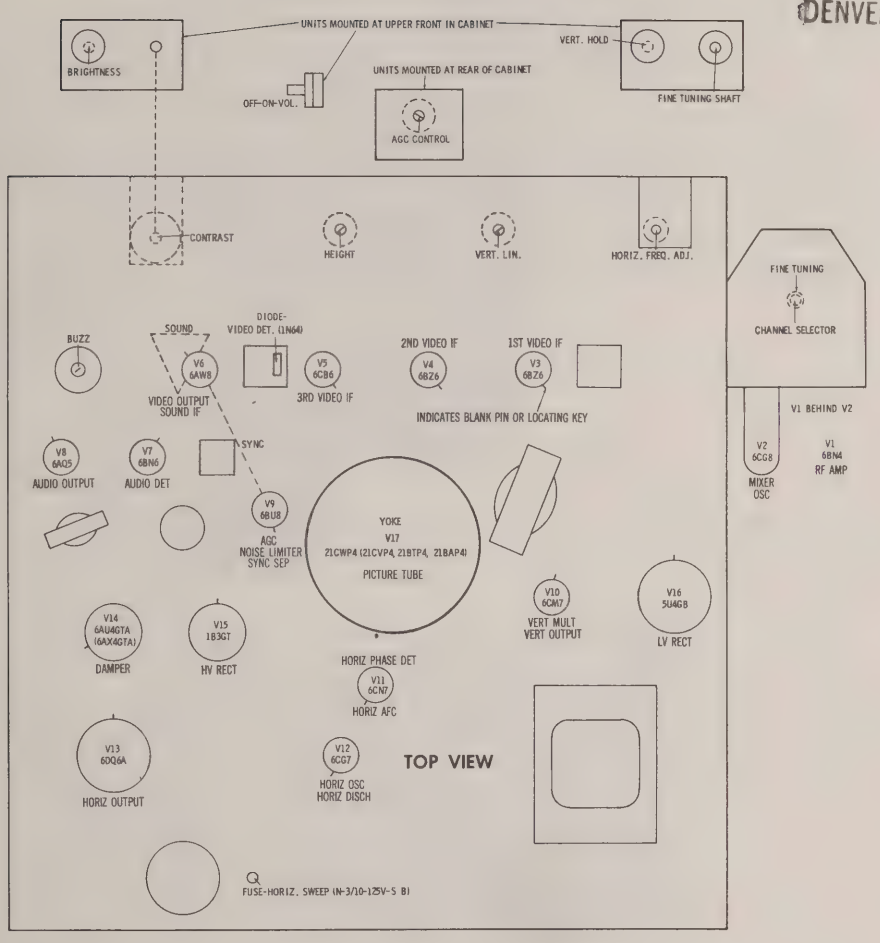
DENVER, COLORADO



TUBE FAILURE CHECK CHART

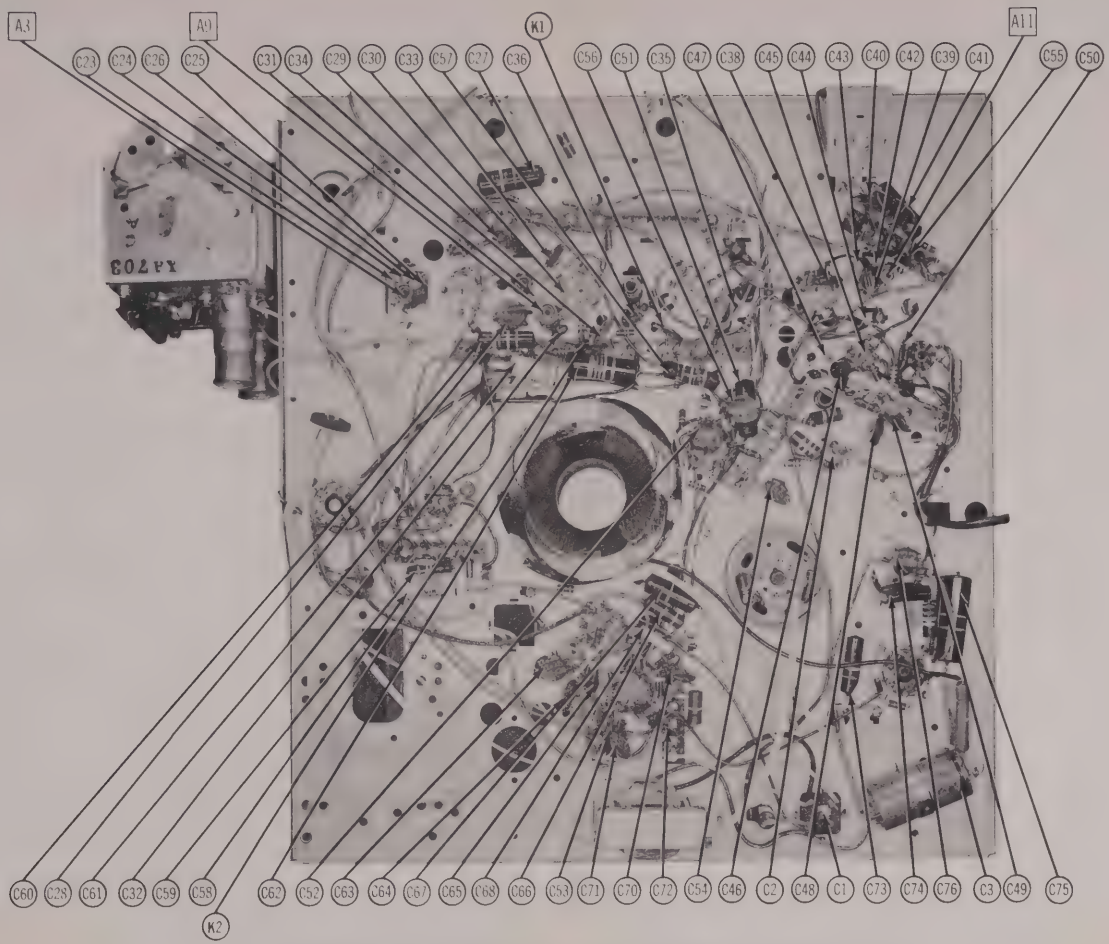
The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - **V16**

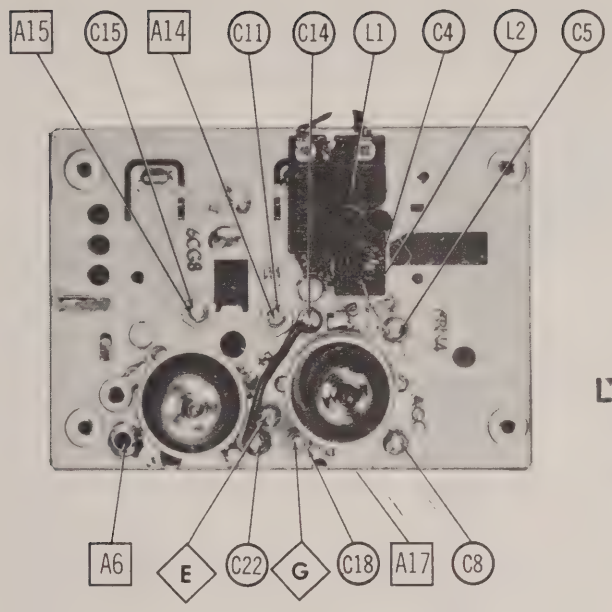
LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V3, V4, V5, Diode (M2), V6**
No pic, no sound, has snow - **V1, V2, V3**
No pic, has sound, has raster - **V6, V17**
Has pic, no sound - **V6, V7, V8**
Overloaded picture - **V9**

SYNC FAILURE
No vert. sync - **V9**
No horiz. sync - **V9, V11**
No vert. or horiz. sync - **V9**

SWEEP FAILURE
No raster, has sound - **Fuse (M1), V11, V12, V13, V14, V15, V17**
No vertical deflection - **V10**
Poor vert. linearity or foldover - **V10**
Poor horiz. linearity or foldover - **V12, V13, V14**
Narrow picture - **V12, V13, V14, V16**
Vert. off freq. - **V10**
Horiz. off freq. - **V12**



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION



PROPERTY OF
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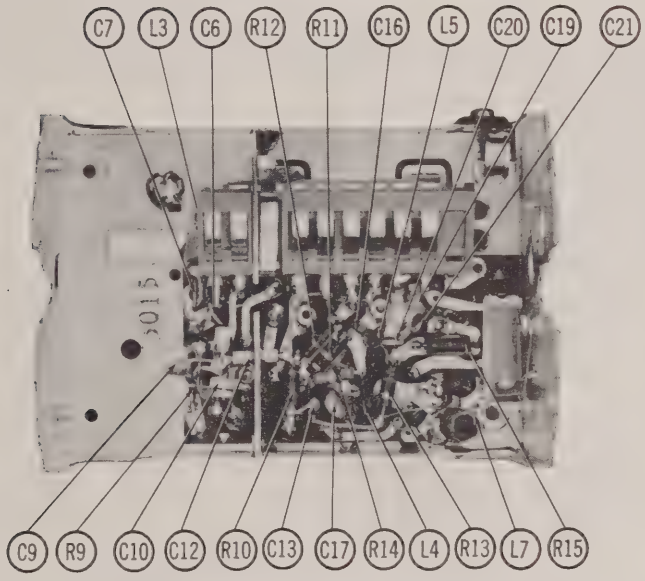
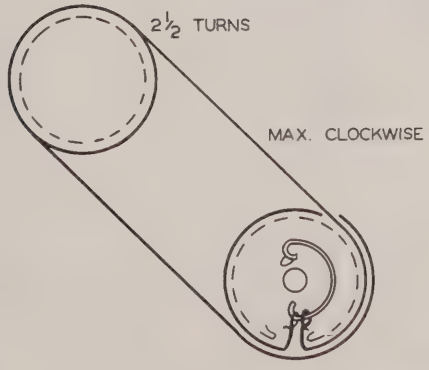
DENVER, COLORADO

RF TUNER TOP VIEW



RF TUNER BOTTOM VIEW



TUNING DRIVE CORD STRINGING
SET 374 FOLDER 16

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Do not remove the horizontal oscillator tube (V12) to disable the high voltage.
The high voltage lead should be securely taped and kept away from the chassis.

VIDEO IF ALIGNMENT

Short pin 1 of the oscillator tube (V2) to chassis.
Connect a short clip lead from point Ⓐ to chassis.
Connect the negative lead of a 5 volt bias supply to point Ⓑ. Connect the positive to point Ⓗ.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use 10MC sweep unless otherwise noted.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	470MMF	High side to point Ⓒ. Low side to chassis.	43.0MC	41.25MC 45.75MC	Any non-interfering channel	Vert. Amp. thru 10K to point Ⓓ. Low side to chassis.	A1, A2	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. Adjust sweep generator for 3 volts peak to peak on scope. If proper response cannot be obtained, check to see that slugs are entering their respective windings from opposite ends of coils.
2.	"	High side to point Ⓔ. Low side to chassis.	"	41.25MC 42.75MC 45.0MC 45.75MC 47.25MC	"	"	A3, A4, A5, A6	Adjust for maximum gain and symmetry of response similar to Fig. 2 with markers as shown. A3 and A6 affect the peak of the curve, A4 the low frequency side and A5, the high side.
3.	"	"	"	41.25MC 47.25MC	"	"	A7, A8	Switch scope gain to 10 times previous setting. Adjust A7 and A8 for maximum attenuation of response at 47.25MC (See Fig. 3). If 41.25MC marker does not fall at 50% or less, retouch A4 SLIGHTLY.
4.	"	"	"	40.5MC 41.25MC 42.75MC 45.0MC 45.75MC	"	"	A9	Reduce scope gain to that used in steps 1 and 2. Remove the bias from point B and connect a jumper from point B to chassis. Adjust sweep output for 3 volts peak to peak on scope. Adjust A9 for maximum amplitude at 40.5MC marker, but not to exceed 41.25MC marker. (See Fig. 4). Restore set to normal.

SOUND IF ALIGNMENT

Connect a step attenuator between the antenna and the receiver antenna terminals.
Tune in a channel and set attenuator for a signal level below the limiting level of 6BN6 as evidenced by a hiss in the sound similar to super-regeneration.
Adjust A10, A11, A12 and A13 for maximum sound and best quality.
Adjust the buzz control (R7) for MINIMUM buzz.
If the hiss disappears during the alignment, further reduce the signal strength with the attenuator.

VHF RF AND MIXER ALIGNMENT

Connect the negative lead of a 0-15 volt variable bias supply to point Ⓕ. Positive to chassis. Adjust bias for 2.5 volts at point Ⓕ.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	Matching Trans.	Across antenna terminals.	195MC	193.25MC 197.75MC	10	Vert. Amp. thru 10K to point Ⓖ. Low side to chassis.	A14, A15, A16	Adjust for maximum gain and symmetry of response similar to Fig. 5 with markers as shown.
6.	"	"	"	"	"	"	A17	Increase bias for MINIMUM amplitude of response curve. Without changing bias, adjust A17 also, to obtain MINIMUM amplitude of response. NOTE: It may be necessary to repeat steps 5 and 6 until desired results are obtained.
7.	"	"	57MC	55.25MC 59.75MC	2	"	A18	Adjust for maximum gain and symmetry of response similar to Fig. 5. Adjust by expanding or compressing coil turns.
			63MC	61.25MC 65.75MC	3		A19	
			69MC	67.25MC 71.75MC	4		A20	
			79MC	77.25MC 81.75MC	5		A21	
			85MC	83.25MC 87.75MC	6		A22	
			177MC	175.25MC 179.75MC	7		A23	
			183MC	181.25MC 185.75MC	8		A24	
			189MC	187.25MC 191.75MC	9		A25	
			201MC	199.25MC 203.75MC	11		A26	
			207MC	205.25MC 209.75MC	12		A27	
			213MC	211.25MC 215.75MC	13		A28	

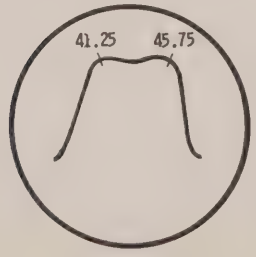


FIG. 1

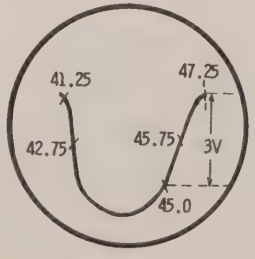


FIG. 2

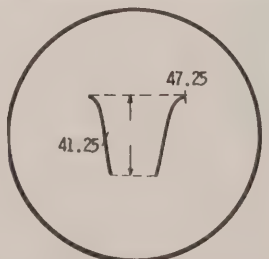


FIG. 3

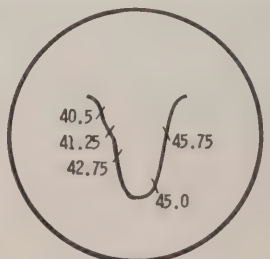


FIG. 4

ALIGNMENT INSTRUCTIONS (cont)

VHF OSCILLATOR ALIGNMENT

Connect bias as under "Video IF Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning to the center of its range.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 47K to point (D). Low side to chassis.	A29	Adjust to place sound marker in trap notch as in Fig. 6. Video marker should fall at 50%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A30	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A31	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A32	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A33	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A34	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A35	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A36	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A37	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A38	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A39	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A40	

UHF TUNER ALIGNMENT

Alignment of the UHF tuner should not be attempted without the proper test equipment.
Switch the receiver to the UHF position.
Connect the negative lead of a 2 volt bias supply to point (B). Positive to point (H).
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Fig. 7	Across antenna terminals.	713MC	711.25MC 715.75MC	54	Vert. Amp. thru 10K to point (D). Low side to chassis.	A41, A42, A43	The rocker arm of the tuner should be in the horizontal position. If necessary, loosen set screw and adjust tuner so that rocker arm is horizontal when the channel indicator is set to channel 54. Do not adjust A41 unless oscillator calibration is off more than 3 channels. If necessary, adjust A41 to place video marker at 50% on response curve as in Fig. 6. The image (weaker response) will appear also. The response toward the counter clockwise position of A41 is the proper response. Adjust A42 and A43 for maximum response similar to Fig. 6.
10.	"	"	473MC	471.25MC 475.75MC	14	"		Check for response similar to Fig. 6. If oscillator is off more than 3 channels, adjust oscillator travel adjustments (oscillator, mixer and antenna travel adjustments are the three nuts on rear of tuner) to scale. Care must be used in making this adjustment so as not to move the rocker arm out of its bearing. Set the mixer and antenna adjustments for maximum amplitude on the scope.
11.	"	"	887MC	885.25MC 889.75MC	83	"	A44, A45, A46	Adjust A44 to place video marker at 50% as in Fig. 6. Adjust A45 and A46 for maximum amplitude and symmetry of response similar to Fig. 6.

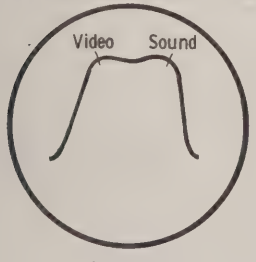


FIG. 5

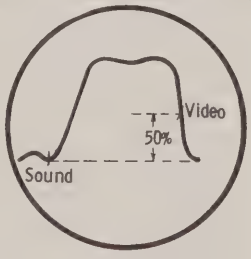


FIG. 6

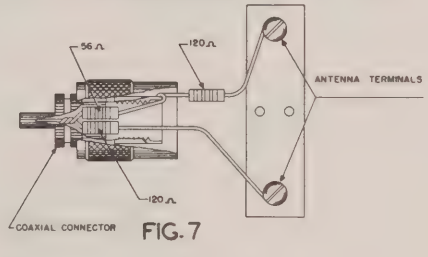


FIG. 7

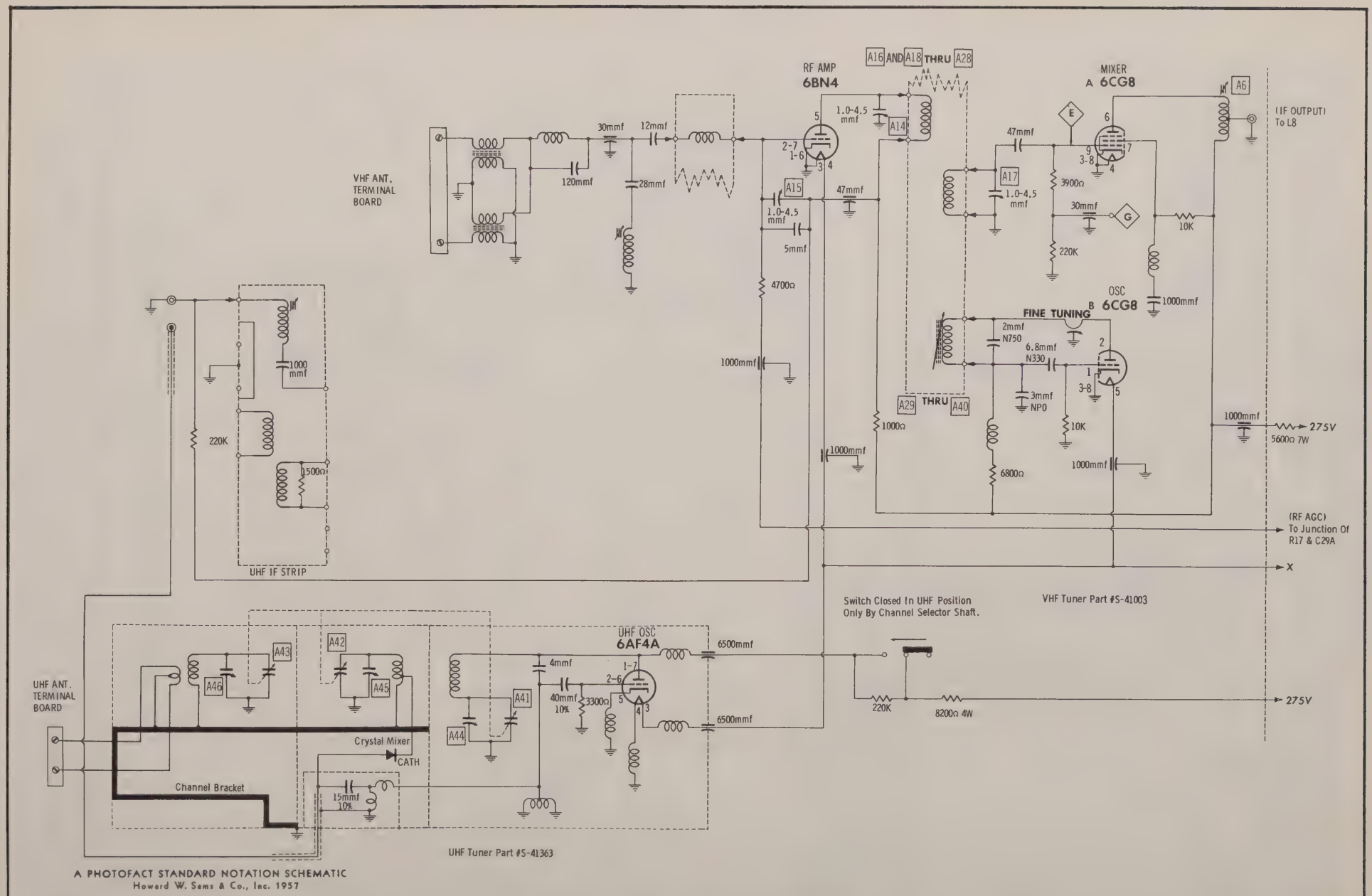
HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern.

Set the brightness and contrast controls for a normal picture.

Turn the horizontal hold clockwise until the picture loses sync. It may be necessary to switch off channel and back again for picture to lose sync.

Turn the horizontal hold slowly counter clockwise until the picture just falls into sync.

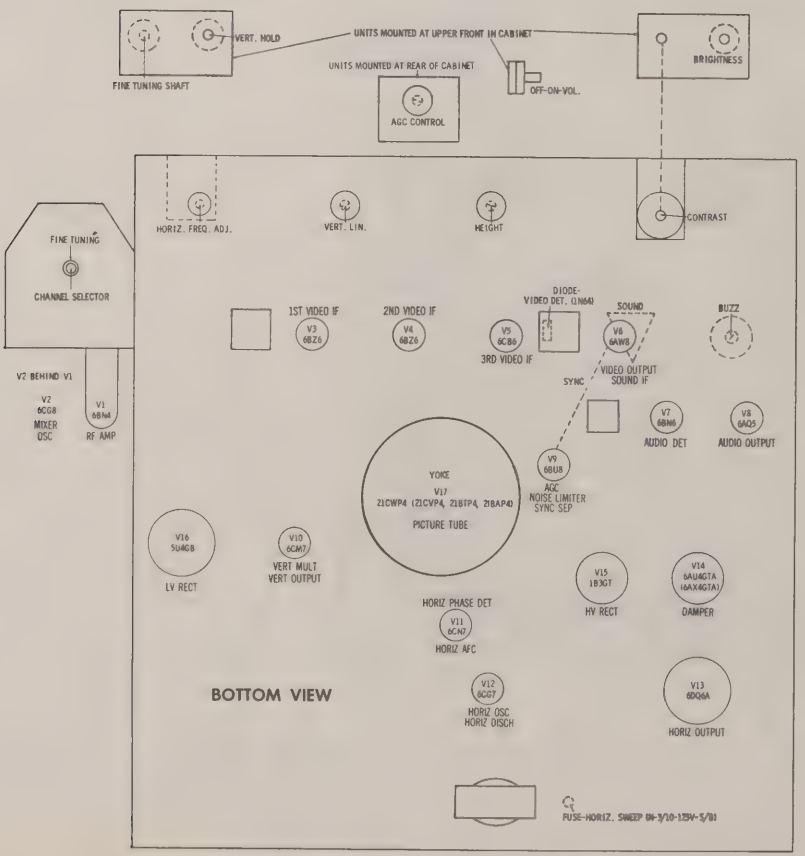


ALTERNATE TUNER SCHEMATIC

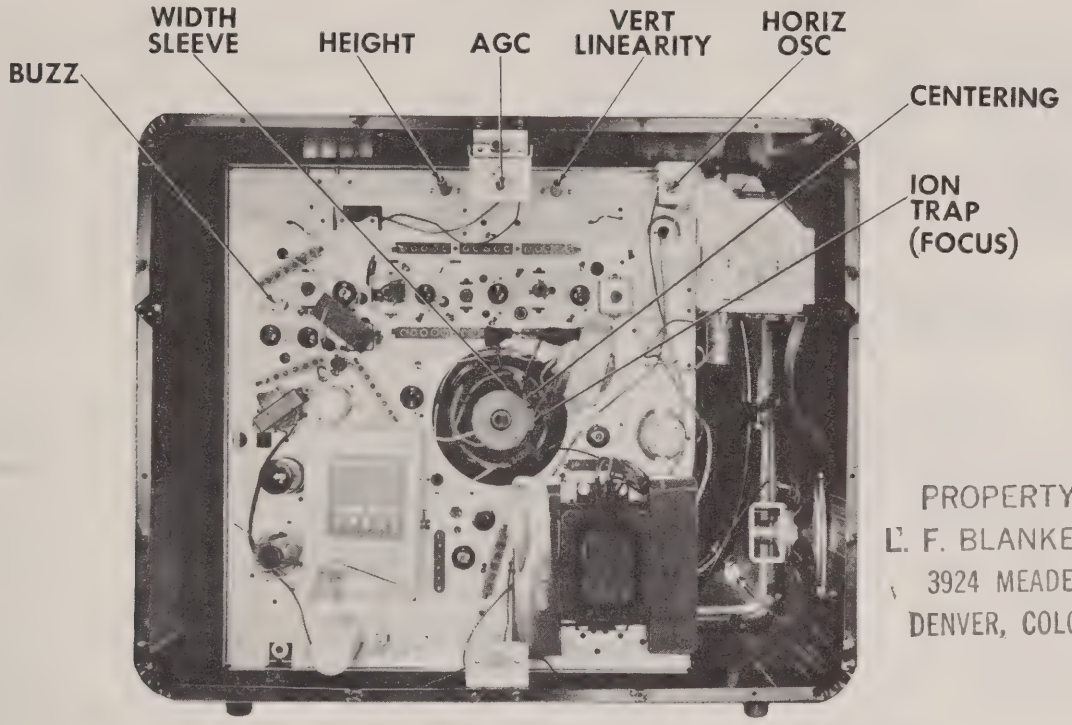
RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BN4	0Ω	3.5Meg	0Ω	.1Ω	† 6700Ω	0Ω	3.5Meg		
V2	6CG8	10K	† 12K	0Ω	0Ω	.1Ω	† 5600Ω	† 16K	0Ω	220K
V3	6BZ6	2.5Meg	1500Ω	0Ω	.1Ω	♦ 220Ω	♦ 220Ω	0Ω		
V4	6BZ6	60K	INF	0Ω	.1Ω	† 285Ω	† 285Ω	INF		
V5	6CB6	.1Ω	120Ω	.1Ω	0Ω	† 8200Ω	† 8200Ω	0Ω		
V6	6AW8	0Ω	100K	† 32K	0Ω	.1Ω	56Ω	4000Ω	† 18K	† 7500Ω
V7	6BN6	● 425Ω	.4Ω	.1Ω	0Ω	† 22K	4.4Ω	† 390K		
V8	6AQ5	0Ω	680Ω	0Ω	.1Ω	† 1300Ω	† 500Ω	● 0Ω		
V9	6BU8	● 0Ω	† 23K	† 60K	0Ω	.1Ω	3.3Meg	† 2.2Meg	1.5Meg	270K
V10	6CM7	‡12K	TP	0Ω	0Ω	.1Ω	● ‡5Meg	● 450K	2.2Meg	●1700Ω
V11	6CN7	2200Ω	2Meg	1Meg	0Ω	.1Ω	560Ω	5Meg	† 47K	NC
V12	6CG7	‡190K	68K	0Ω	0Ω	.1Ω	† 65Ω	32K	10K	0Ω
V13	6DQ6A	TP	.1Ω	TP	† 8000Ω	1Meg	TP	0Ω	0Ω	TOP CAP ‡14Ω
V14	6AU4GTA	TP	NC	¶	NC	† 65Ω	NC	0Ω	.1Ω	
V15	1B3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP ‡274Ω
V16	5U4GB	NC	60K	TP	35Ω	TP	32Ω	NC	60K	
V17	21CWP4	0Ω	24K	PIN 6 ‡480K	PIN 10 ‡480K	PIN 11 270K	PIN 12 .1Ω			

† MEASURED FROM PIN 8 OF V16.
‡ MEASURED FROM PIN 3 OF V14.
♦ MEASURED FROM PIN 2 OF V4.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
¶ THIS READING CAN VARY GREATLY, (10K MINIMUM), DUE TO THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
TP TIE POINT
NC NO CONNECTION

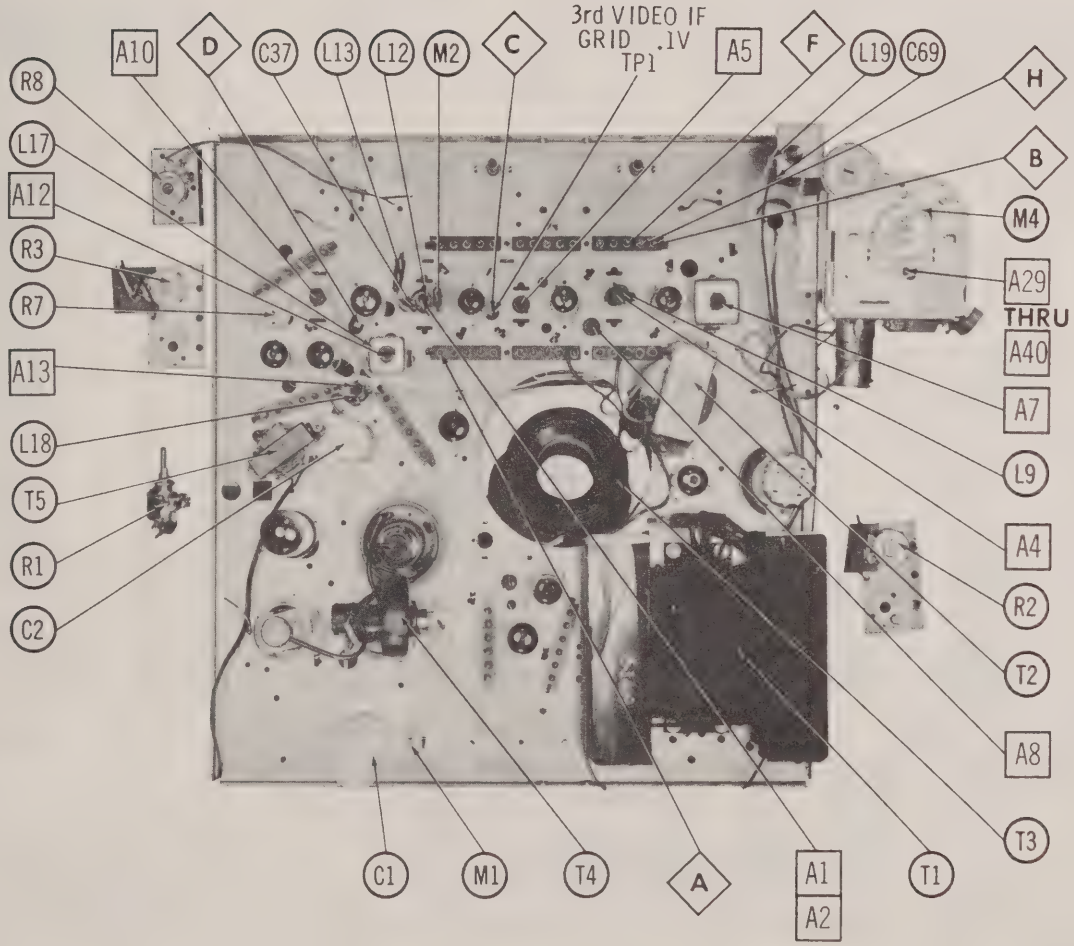


TUBE PLACEMENT CHART



PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

CABINET-REAR VIEW



CHASSIS TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	RF Amplifier	6BN6	
V2	Mixer-Oscillator	6CG8	
V3	1st IF Amplifier	6BZ6	
V4	2nd IF Amplifier	6BZ6	
V5	3rd IF Amplifier	6CB6	
V6	Video Output-Sound IF Amp	6AW8	
V7	Audio Detector	6BN6	
V8	Audio Output	6AQ8	
V9	AGC-Noise Limiter-Sync Separator	6BU8	

ITEM No	USE	TYPE	NOTES
V10	Vert Mult - Vert Output	6CM7	
V11	Horiz Phase Det - Horiz AFC	6CM7	
V12	Horiz Osc - Horiz Discharge	6CG7	
V13	Horiz. Output	6DQ6A	
V14	Damper	6AU4GTA	Note 1
V15	HV Rectifier	1B3GT	
V16	LV Rectifier	5U4GB	

Note 1. A 6AX4GTA may be used in some versions.

PICTURE TUBE

ITEM No	REPLACEMENT DATA: ZENITH PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	NOTES
V17	21CWP4	21CWP4 ① ②	Aluminized	
	21CVP4		② Silver screen '65	
	21DT24	21DT24 ①		
	21DAP4	21DAP4 ①		
	21DNP4			

ELECTROLYTIC CAPACITORS

ITEM No	RATING: CAP	VOLT	ZENITH PART No	AEROVOX PART No	CORNELL DUBILIER PART No	MALLORY PART No	PYRAMID PART No	SANGAMO PART No	SPRAGUE PART No	NOTES
C1A	●40	400	22-3743	AFH4-58-75	BC480 ● BR605	FP386	TMD-58 ● TD-60-350	D-255 ● MD-1530	R2285 *	
B	●40	450								
C	●60	50								
C2A	●4	250	22-3744	AFH3-180	BC631 ● BR635	FP231 ● FC80	TMD-78 ● TD-4-450	D-345 ● FM-4504	R2416 *	
B	●0	600								
C3	20	25								
	10	400	22-3870 ①	PRS400YP ●	BR2045 ● BR2045 †	TC75 ● TC75 †		MT-4520 ● MT-4520 †	R2286 *	

* Non-catalog item.
† Connect negative leads together
① Non-polarized unit

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP	VOLT	ZENITH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C4	120		23-3923	MPO-81 150	TCS-130	L107Z	ED-120		MS-531	10%
C5	30		23-3921							5%
C6	25		23-3920							10%
C7	13		22-2367						502C-DI	
C8	1000		23-3912	EF-001	MFT-1000					N900
C9	5		23-3911							
C10	1 0 - 4 5		23-3909		529-5		533-B			
C1l	3 0 - 4 5		23-3909		529-5		533-B			
C12	47		23-3917		10K					5%
C13	1000		23-3913	EF-002	MFT-1000				502C-DI	
C14	1000		23-3913	EF-001	MFT-1000				502C-DI	
C15	1 0 - 4 5		23-3909		529-5		533-B			
C16	47		23-3915							10%
C17	1000		23-3911	BPD-001	DD-105	BY A501	ED-1000	DC52L	32K-DI	
C18	30		23-3918							
C19	2 0		22-3810							N750
C20	6 8		22-3922							N530
C21	3 0		22-3914							
C22	1000		23-3913	EF-001	MFT-1000				502C-DI	
C23	17		23-3916							5%
C24	12		23-3918							
C25	470	1000	23-3926	HVD-18-1000	DCS0-47	BY A107 ● BY A107 †	HD15-1000	DC30547	10GAB-T47	
C26	8		23-3921			C3GVBC				
C27	15	200	23-3947	P388N-15		CUSB215	ED-5300		2TM-P15	
C28	470		23-16		D5-471	SR3T47	ED-470		34S-347	10%
C29A	4700		23-24	BPD-X2D047		BY C6DD47	ED-4047 ● ED-4047 †	UC-5347 ● UC-5347 †	54K-2D47	
B	4700									
C30	68		22-1766		TCZ-R68		TCO-..68			
C31	7		22-3913			C10YCC				NPO
C32	16		22-3296			C10QS5C				10%
C33A	1000		23-31				ED-1000		MS-31	10%
B	1000						ED-1000		MS-31	10%
C34	470		23-16		D5-471	SR3T47	ED-470		34S-347	10%
C35	330		22-3867	1469-00033	D5-331	SR3T33	ED-330		34S-333	10%
C36	1000	1000	22-17							10%
C37	4 7		23-3867	MPO-S1 4.7	TCZ-4R7	C30Y47C	TCO-4.7	ZT-5547		
C38	3300		23-11	BPD-0053	D6-332	BY A10D33	ED-0033	UC-5333	5GA-D33	N80 5%
C39	47		23-3467							
C40	10000		BPD-01	DD-105	BY A501	ED-01	DC51L	34K-51		
C41	1	200	22-1777	P388N-1	DF-104	CUB2P1		GEM-301	2TM-P1	
C42	3 3		23-3922	MPO-S1 3.3	TCZ-3R3	C30Y3RC	TCO-3.3	ZT-5533	5TCCD-Y33	
C43	50		23-3460	MPO-S1 50	TCZ-50	C10QSC	TCO-50	UC-549	5GA-Q5	
C44	2.4		23-3596							5%
C45	7 5		23-2742							
C46A	1000		23-31				ED-1000		MS-31	10%
B	1000						ED-1000		MS-31	10%
C47	10		22-3721							N150 10%
C48	470	1000	23-6	BVD-15-470	DD90-47	BY A107 ● BY A107 †	HD15-470	DC30547	10GAB-T47	
C49	10000		23-3	BPD-01	DD-105	BY A501	ED-01	DC51L	34K-51	
C50	2200		23-6	BPD-0032	D6-223	BY A10D22	ED-0022	UC-5322	5GA-Q22	
C51	1	200	22-1777	P388N-1	DF-104	CUB2P1		GEM-301	2TM-P1	
C52	150		23-9	MPO-S1 100	D6-101	L107I	ED-100	ZT-551	34S-31	10%
C53	10000		23-3	BPD-01	DD-105	BY A501	ED-01	DC51L	34K-51	
C54	10000		23-3	BPD-01	DD-105	BY A501	ED-01	DC51L	34K-51	
C55	470	1000	23-6	BVD-15-470	DD90-47	BY A107 ● BY A107 †	HD15-470	DC30547	10GAB-T47	
C56	3300		22-11	BPD-0033	D6-332	BY A10D33	ED-0033	UC-5333	5GA-T33	
C57	033	400	22-2625							10%
C58	1	400	22-3061	P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C59	01	400	22-3585							10%
C60	0047	600	22-1849							20%
C61	047	200	22-1779	BPD-05		CUB4S47			4TM-S47	
C62	033	600	22-3223							10%
C63A	51		23-35	MPO-S1 50	TCZ-51	L10QS1	TCO-51	UC-545	5GA-Q5	
B	51			MPO-S1 50	TCZ-51	L10QS1	TCO-51	UC-545	5GA-Q5	

CAPACITORS (cont)

ITEM No	RATING: CAP	VOLT	ZENITH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C64A	1000		23-31				ED-1000		MS-31	10%
B	1000						ED-1000		MS-31	10%
C65	2200		22-18						MS-332	
C66	01	400	22-1809	BPD-01	D6-103	CUB4S1	GP-1000	GEM-4Ll	4TM-S1	
C67	1	200	22-1777	P388N-1	DF-104	CUB2P1		GEM-301	2TM-P1	
C68	680		22-2668	1464-00068	D6-681	P2H5766	ED-680		MS-368	10%
C69	1000		23-3163				ED-1000	MC5381	MS-31	10%
C70	1500		23-13							10%
C71	1000	1000	22-17				ED-1000		MS-31	10%
C72A	1000		23-31							10%
B	1000						ED-1000		MS-31	10%
C73	01	600	22-1843				ED-1000		MS-31	10%
C74	330	4000	22-2697							N1500 10%
C75	15	400	22-2261	P488N-15		CUB4P15		GEM-4015	4TM-P15	
C76	10000		22-3	BPD-01	DD-103	BY A501	ED-01	DC51	34K-51	
C77	72	2000								

CONTROLS

ITEM No	RATING: RESISTANCE	WATTS	REPLACEMENT DATA: ZENITH PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No	INSTALLATION NOTES
R1A	1Meg	½	83-3938	B-70	A67-1Meg-G	QU-137	U64	Volume - Note 1
B	Shaft			Not Req.	Not Req.	FS-3	Not Req.	
C	Switch			KB-1	SWE-13	78-1	U5-38	
R2	500K	½	83-3871	B-61		QT-133	T-A868R	Brightness
R3A	750K	½	83-3872	B-66	A67-750K-G	QU-136	U64	Vert. Hold
B	Shaft			Not Req.	8B8-3	Not Req.	Not Req.	
R4A	7.5Meg	½	83-3294	AB-89 ①	A67-7.5Meg-G ①	QU-142 ①	PTA8561 ①	Height with 1Meg stop
B	Shaft			AK-1	F1H-1/2	TQ	Not Req.	
R5A	3500Ω	½	83-3295	AB-9	A67-4000-S	QU-116	Not Req.	Vert. Lin.
B	Shaft			AK-1	F1H-1/2	TQ	Not Req.	
R6A	7000Ω	3	83-3288	WW-753 *	A43-7500 *	WPK7500 *	R7500L *	Contrast - Wire wound
B	Shaft			Not Req.	F8-3	Not Req.	12K-16	
R7	750Ω	3	83-3384		39-500-50		FL-750	Buzz - Wire wound
R8A	750K	½	83-3362			BU-136	PTA7541	AGC Note 2
B	Shaft					7M5-R1	Not Req.	

Note 1. Alternate part #83-3969 may be used in some versions with push type on-off switch.
Note 2. Alternate part #83-3968 may be used in some versions.
† A 1Meg resistor in series with the right hand terminal.
* Cut shaft to length and file double flat.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING: OHMS	WATT	REPLACEMENT DATA: ZENITH PART No.	IRC PART No.	NOTES
R9	4700Ω		23-3924	BTS-4700	
R10	1000Ω		23-3905	BTS-1000	
R11	3900Ω		23-3909	BTS-3900	
R12	330K		23-3928	BTS-330K	
R13	6800Ω		23-3907	BTS-6800	
R14	10K		23-3915	BTS-10K	
R15	5600Ω	7	23-3368		
R17	2.2Meg		23-1925		
R18	1Meg		23-1911		
R19	2.7Meg		23-1929		
R20	2.2Meg		23-1925		
R21	180K		23-1880		
R22	220K		23-1883	BTS-220K	
R23	10K		23-1827		
R24	220Ω		23-1758	BTS-220	
R25	56Ω		23-1753	BTS-56	
R26	150Ω		23-1792	BTS-1500	
R27	130K		23-1873		
R28	150K		23-1878		
R29	220Ω		23-1758	BTS-220	
R30	2200Ω	4	23-3362	PW4-2200	
R31	120Ω		23-1747	BTS-120	
R32	4700Ω		23-1815	BTS-4700	
R33	47K		23-1827	BTS-47K	
R34	330Ω		23-1758	BTS-330	Note 1
R35	56Ω		23-1753	BTS-56	
R36	390K		23-1894	BTS-390K	
R37	470K		23-1885	BTS-470K	
R38	330K		23-1883	BTS-330K	
R39	1800Ω		23-1796	BTS-1800	
R40	68K		23-1852	BTS-68K	
R41	470K		23-1898	BTS-470K	
R42	33Ω		23-1752	BTS-33K	
R43	1.5Meg		23-1935	BTS-1.5Meg	
R44	2.2Meg		23-1925		
R45	680K		23-1904		
R46	180K		23-1880	BTS-180K	
R47	100K		23-1869	BTS-100K	
R48	10K		23-1827	BTS-10K	
R49	680Ω		23-1779	BTS-680	

ITEM No.	RATING: OHMS	WATT	REPLACEMENT DATA: ZENITH PART No.	IRC PART No.	NOTES
R50	390K		23-1894	BTS-390K	
R51	22K	2	23-1566	BTS-22K	
R52	470Ω		23-1771	BTS-470	Note 2
R53	680Ω	1	23-329	BTA-680	
R54	4700Ω		23-1813	BTS-4700	
R55	270K		23-1887	BTS-270K	
R56	220K		23-1883	BTS-220K	
R57	100K		23-1869	BTS-100K	
R58	3.3Meg		23-1932	BTS-3.3Meg	
R59	18K		23-1838	BTS-18K	
R60	330K		23-1890	BTS-330K	
R61	82K		23-1866	BTS-82K	
R62	100K		23-1869	BTS-100K	
R63	220Ω		23-1758	BTS-220	
R64	3.3Meg		23-1932	BTS-3.3Meg	
R65	22K		23-1841	BTS-22K	
R66	1000Ω	1	23-962	BTA-1000	
R67	390Ω				
R68	180Ω		23-1902		
R69	2200Ω		23-1799	BTS-2200	
R70	1Meg		23-1811		
R71	1Meg		23-1811		
R72	10Meg		23-1953		
R73	10Meg		23-1953		
R74	47K	1	23-1194		
R75	68K	2	23-1545		
R76	560Ω		23-1775		
R77	22K		23-1841		
R78	68K		23-1852		
R79	180K	1	23-2313		
R80	22K		23-1841		
R81	100Ω		23-1744	BTS-100	
R82	1Meg		23-1811	BTS-1Meg	
R83	100Ω		23-1744	BTS-100	
R84	18K	2		BTS-18K	Note 2
R85	15K	2		BTS-15K	Note 2
R86	10K	4	23-3633	PW10-10K	
R87	4.7Ω 5%		23-1841	BWl-4.7 5%	
R88	22K	1	23-1055	BTA-22K	
R89	18K	2	23-2364	BTS-18K	
R90	220K		23-3607	BTS-220K	

Note 1. Not used in some versions.
Note 2. Chassis 17Z32Q, QU use a 330Ω, 2W (Part #83-1622) in this application.
Note 3. Some versions may use a single 820ΩΩ, 4W (Part #83-3603) in this application.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	SEC. 1	SEC. 2	SEC. 3	ZENITH PART No.	REPLACEMENT DATA: Hallodorson PART No.	Merit PART No.	Stancor PART No.	Thordorson PART No.	Triad PART No.
T1	117VAC	800VCT	5V	6.3V	25-1499 ①					
	① 1.5A	② .280A	③ 3A	④ 2.1A						

① Alternate part #96-1535 used in some versions.
② Drill one new mounting hole

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA: ZENITH PART No	Hallodorson PART No	Merit PART No	RCA TYPE No.	Ram PART No	Stancor PART No	Thordorson PART No	Triad PART No
T2	Vert. Output	25-1479	Z2807 ①	A-2824	V315 ①	VO-103	20676 ①	A-119X ②
T3A	Horiz. Output (13MH)	25-1452 ②	DF608 ③④	MDF-18 ③	2370A ③④	V90F12/47 ④ ⑤	DY-12A ⑤	Y-39 ③	Y-40 ③④
	90° Vert (37.5MH)								
	Alternate Yoke	25-1435					X137 ⑦ *	HO-271 ⑦ *	FLY-118 ⑦ *
M6	Centering Device	S-22280							
T4	Horiz. Output	S-41195							

① Cut and tape blanking lead.
② Drill new mounting hole(s)
③ Includes resistors R67, R68 and capacitor (C77).
④ Connect horizontal network across yoke terminals #3 and #7.
⑤ Use original yoke network, connect yoke terminal #2 to horizontal output transformer #2, yoke terminal #1 to horizontal output transformer #1. Cut and form a piece of .010 gauge fish paper inside the yoke itself and support with an acetate cement, to provide an insulation between the width sleeve and the yoke proper
⑥ Connect horizontal output transformer terminal #2 to yoke terminal #2, horizontal output transformer terminal #1 to yoke terminal #7, cut and tape orange lead.
⑦ Use original mounting bracket.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL CONNECTIONS	Hallodorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordorson Replacement Connections	Triad Replacement Connections
4				4	4	4	
3		3		3	3	3	
2		2		2	2	2	
1		1		1	1	1	

TRANSFORMER (AUDIO OUTPUT)

ITEM No	IMPEDANCE: PRI.	SEC.	REPLACEMENT DATA: ZENITH PART No.	Hallodorson PART No.	Merit PART No.	Stancor PART No.	Thordorson PART No.	Triad PART No.	NOTES
T5	10 5K	3-4Ω	25-1483	Z1117	A-2932	A-3879	24652	S-17X	

SPEAKER

ITEM No.	TYPE: SIZE	FIELD	V C	IMP	REPLACEMENT DATA: ZENITH PART No	QUAM PART No	NOTES
SP1	5 1/4"	PM		3-4Ω	49-781 ①	62Ai	① Used in Models 23000EZ, 23000EZ, RZ, RZU, 23001EZ, RZ, RZU, RZ, 23225CZ, CZU, EZ, FZU, RZ, RZU, YZ,
	8"	PM		3-4Ω	49-780 ②	8Ai	② Used in Models 23245EZ, RZ, RZU, RZ, 23244EZ,
	10"	PM		3-4Ω	49-783 ③	10Ai	③ Used in Models 23248EZ, RZ, RZU, RZ, 23004EZ,
	10"	PM		3-4Ω	49-818 ④		④ Used in Models 23251EZ, RZ, RZU, RZ, 23008EZ,
					49-764 ⑤	10Ai023.1	⑤ Used in Models 23008EZ, RZ, RZU, RZ, 23009EZ,
					S-23238 ⑥ ⑦		⑥ Used in Models 23281EZ, RZ, RZU, RZ, 23282EZ,
							⑦ Electrostatic, two used.

COILS (RF-IF)

ITEM No.	USE	ZENITH PART No.	ITEM No.	USE	ZENITH PART No.
L1	Ant. Trans.	S-40458	L6E	Ant., RF, Mixer Grid & Osc. Coils	S-40476
L2	IF Trap	20-657	F	"	S-40477
L3	IF Trap	S-40497	G	"	S-40478
L4	Mixer Grid Coil	20-656	H	"	S-40479
L5	RF Choke	20-655	I	"	S-40480
L6A	Ant., RF, Mixer Grid & Osc. Coils	S-40472	J	"	S-40481
B	"	S-40473	K	"	S-40482
C	"	S-40474	L	"	S-40483
D	"	S-40475	L7	Mixer Plate Coil	20-655

ITEM No	USE	REPLACEMENT DATA: ZENITH PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L8	1st. Video IF	S-41370				Includes Trap and Assembly
L8	2nd. Video IF	S-41391	17-4523 *	TV-130 *	6216 *	
L8A	4.5MC Trap	S-41396				
B	47.25MC Trap					
L9	3rd. Video IF	S-23993	17-4533 *	TV-130 *	6219 *	
L10	4th. Video IF	S-23999	17-4533 *	TV-130 *	6219 *	
L12	Resonant Choke	S-23644				25 Microhenries
L14	Shunt Peaking Coil	S-16018	19-3300	TV-190	6133	330 Microhenries
L8A	4.5MC Trap	S-23350		TV-130 *		
B	1st. Sound IF					
L16	Series Peaking Coil	S-20880	19-325 ▲		6135 ▲	127 Microhenries, wound on 18K resistor
L17	2nd. Sound IF	S-23548				Includes Cap.
L18	Quadrature Coil	S-19030	20-1005 *	TV-131	1480 *	

* Drill new mounting holes.
▲ Parallel with 18K resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.: PRI.	SEC.	REPLACEMENT DATA: ZENITH PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Ram PART No.	Thordorson PART No.	NOTES
L19	155Ω *		S-19748	19-1577	MWC-13	6134			28-5	90-110 Millihenries

* Tapped ① 55Ω.

PARTS LIST AND DESCRIPTIONS (Continued)

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	ZENITH PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L20	.250A	65Ω	1.8 HY.	95-1376 ①	C5037 ②	C-2991 ②	C-2326 ②	26C44	C-23X

① Alternate part numbers used in this application 95-1507, 95-1521, 95-1531, 95-1532, 95-1533, 95-1542.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	ZENITH PART No.	REPLACEMENT DATA
K1	Vert. Integrator		87-5	
K2	Vert. Integrator		87-4	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			ZENITH PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	N	* 3/10	136-33	62-18	333.300 (N 3/10)	346008	N 3/10	HN 0 to 3/10

* N 1/4 used in some versions.

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		ZENITH PART No.	CBS PART No.	SYLVANIA PART No.	
M2	1N64	103-18	1N64	1N60	Video Detector (Pigtail)

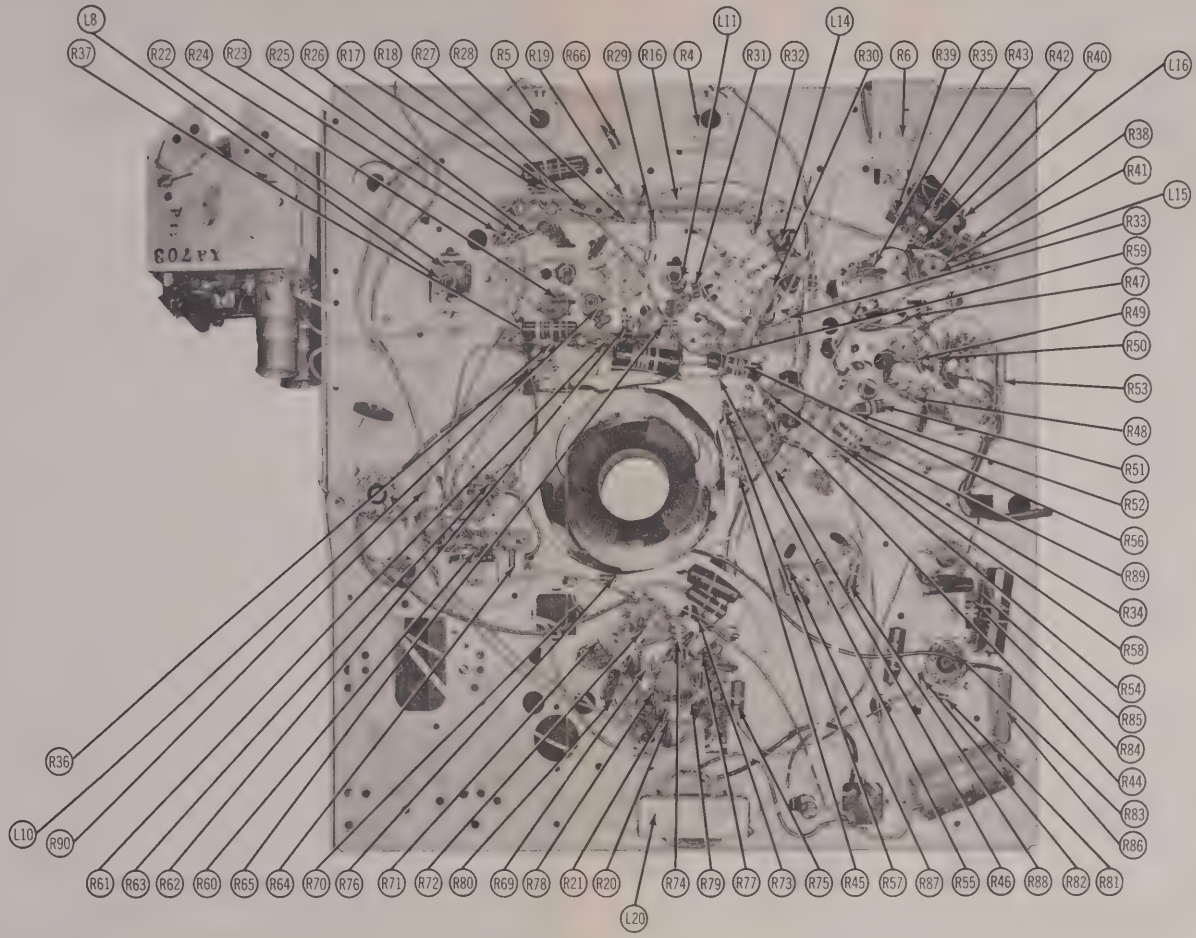
MISCELLANEOUS

ITEM No.	PART NAME	ZENITH PART No.	NOTES
M3	Pilot Light	100-198	
M4	Tuner	S-41002	VHF - Chassis 17Z31, 17Z32
	Tuner	S-41012	VHF - Chassis 17Z32Q, QU, 17Z34Q, QU
	Tuner	S-41363	UHF - Chassis 17Z31U, 17Z32U
	Tuner	S-41003	VHF - Chassis 17Z31U, 17Z32U
M5	Width Sleeve		
M6	Centering Device	S-22560	
M7	Ion Trap	S-22574	

CABINETS & CABINET PARTS

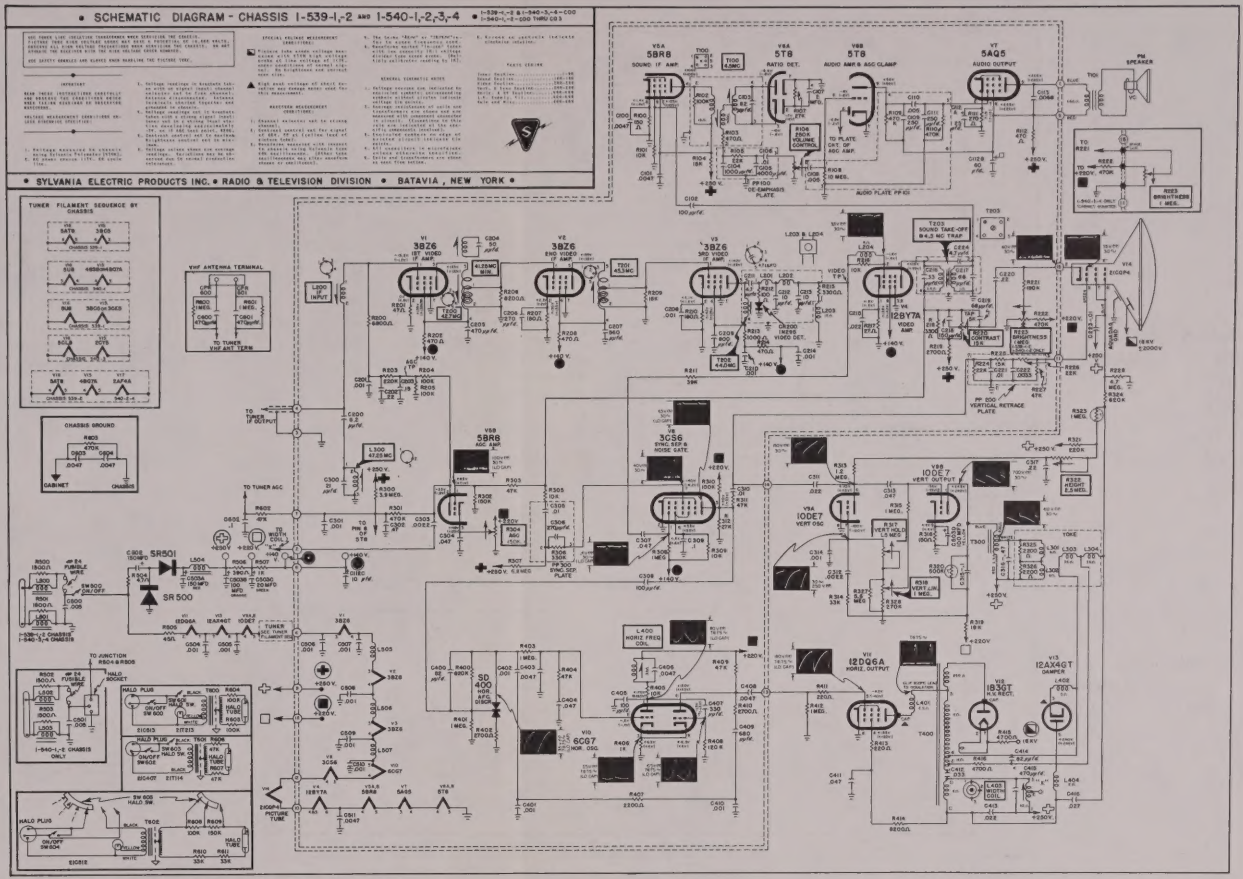
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Safety Glass	192-216	In Models using Ch. 17Z31, U
Safety Glass	192-226	In Models using Ch. 17Z32, U, Q, QU, 17Z34Q, QU
Mask	57-2323	In Models using Ch. 17Z31, U
Mask	57-2332	Models Z2243EZ, EZU, RZ, RZU, Z2251EZ, EZU, RZ, RZU
Mask	57-2330	Models Z2244EZ, EZU, RZ, RZU, Z2249EZ, EZU, RZ, RZU, Z2282EZ, EZU, RZ, RZU
Mask	57-2352	Models Z3000EZ, EZU, RZ, RZU, Z3001EZ, EZU, RZ, RZU, Z3004EZ, EZU, RZ, RZU, Z3008EZ, EZU, RZ, RZU
Knob	S-22863	UHF Channel Selector - All UHF versions
Knob	S-40973	VHF Channel Selector - Models Z2223CZ, CZU, EZ, EZU, RZ, RZU, YZ, YZU, Z2244EZ, EZU, RZ, RZU, Z2249EZ, EZU, RZ, RZU, Z2282EZ, EZU, RZ, RZU
Knob	S-24875	VHF Channel Selector - Models Z2243RZ, RZU, Z2251EZ, EZU
Knob	S-24855	VHF Channel Selector - Models Z2243RZ, RZU, Z2251RZ, RZU, Z3000EZ, EZU, RZ, RZU, Z3001EZ, EZU, RZ, RZU, Z3004EZ, EZU, RZ, RZU, Z3008EZ, EZU, RZ, RZU
Knob	S-41057	Fine Tuning, Contrast - Models Z2223CZ, CZU, EZ, EZU, RZ, RZU, YZ, YZU
Knob	S-40728	Fine Tuning, Contrast - Models Z2243EZ, EZU, Z2251EZ, EZU
Knob	S-40727	Fine Tuning, Contrast - Models Z2243RZ, RZU, Z2251RZ, RZU, Z3000EZ, EZU, RZ, RZU, Z3001EZ, EZU, RZ, RZU, Z3004EZ, EZU, RZ, RZU, Z3008EZ, EZU, RZ, RZU
Knob	S-41022	Fine Tuning, Contrast - Models Z2244EZ, EZU, RZ, RZU, Z2249EZ, EZU, RZ, RZU, Z2282EZ, EZU, RZ, RZU
Knob	46-1700	On-off-volume - Models Z2223CZ, CZU, EZ, EZU, RZ, RZU, YZ, YZU, Z2244EZ, EZU, RZ, RZU, Z2249EZ, EZU, RZ, RZU, Z2282EZ, EZU, RZ, RZU
Knob	46-1585	On-off-volume - Models Z2243EZ, EZU, Z2251EZ, EZU
Knob	46-1541	On-off-volume - Models Z2243RZ, RZU, Z2251RZ, RZU
Knob	46-1742	On-off-volume - Models Z3000EZ, EZU, RZ, RZU, Z3001EZ, EZU, RZ, RZU, Z3004EZ, EZU, RZ, RZU, Z3008EZ, EZU, RZ, RZU
Knob	46-1301	Tone - Models Z2282EZ, EZU
Knob	46-1318	Tone - Models Z2282EZ, EZU
Knob	46-1300	Tone - Models Z2283RZ, RZU
Knob	46-1317	Tone - Models Z2283RZ, RZU
Knob	S-40946	Brightness, Vert. Hold - Models Z2223CZ, CZU, EZ, EZU, RZ, RZU, YZ, YZU
Knob	S-24913	Brightness, Vert. Hold - Models Z2243EZ, EZU, Z2251EZ, EZU
Knob	S-24912	Brightness, Vert. Hold - Models Z2243RZ, RZU, Z2251RZ, RZU, Z3000EZ, EZU, RZ, RZU, Z3001EZ, EZU, RZ, RZU, Z3004EZ, EZU, RZ, RZU, Z3008EZ, EZU, RZ, RZU
Knob	S-41021	Brightness, Vert. Hold - Models Z2244EZ, EZU, RZ, RZU, Z2249EZ, EZU, RZ, RZU, Z2282EZ, EZU, RZ, RZU
Knob	46-1785	Horiz. Hold
Dial	S-22025	UHF - All versions except "Q" Chassis



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

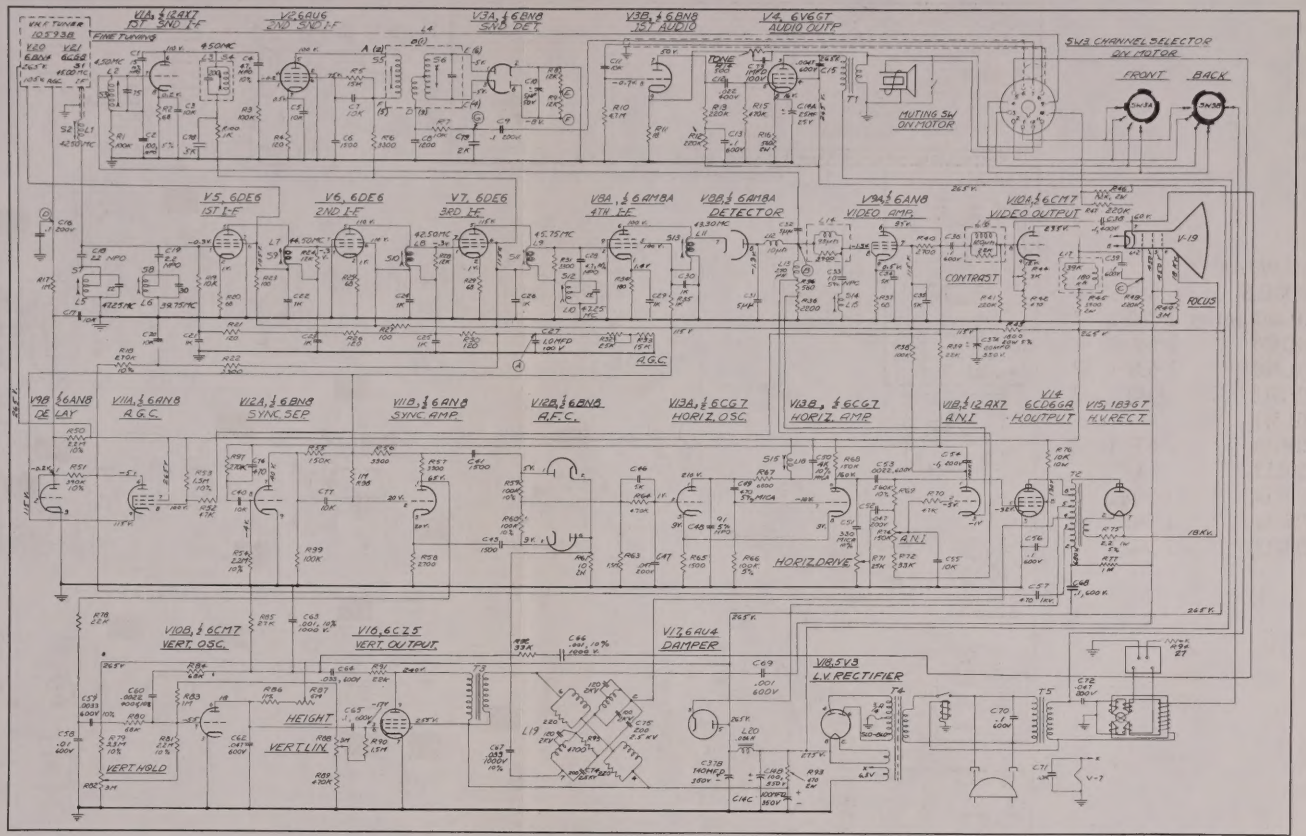
SYLVANIA MODELS	CHASSIS
21C407 Series	1-540-1, -2
21C408 "	1-540-3, -4
21C409 "	1-539-1, -2
21C512 "	1-540-1, -2
21C513 "	"
21P101 "	1-539-1, -2
21T113 "	"
21T114 "	1-540-1, -2
21T115 "	1-540-3, -4
21T213 "	1-540-1, -2


SCHEMATIC DIAGRAM - CHASSIS 1-539-1,-2 AND 1-540-1,-2,-3,-4
SYLVANIA ELECTRIC PRODUCTS INC. • RADIO & TELEVISION DIVISION • BATAVIA, NEW YORK

SCHEMATIC COURTESY OF SYLVANIA ELECTRIC PRODUCTS INC.

PACKARD BELL

MODELS	CHASSIS
21DC5	98D3
21DC6	"
21DC7	"
24DC4	"



SCHEMATIC COURTESY OF PACKARD-BELL ELECTRONICS CORP.

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